

Service Manual



Service Manual

LG-A310



Model : LG-A310

Table Of Contents

1. INTRODUCTION.....	5	4.10 Camera Troubleshooting (5M CAMERA).....	92
1.1 Purpose.....	5	4.11 Main/Slide KEY LED Troubleshooting	94
1.2 Regulatory Information	5	4.12 LCD Troubleshooting.....	96
1.3 Abbreviations.....	7	4.13 Vibrator Troubleshooting.....	98
2. PERFORMANCE.....	9	4.14 Receiver Path	99
2.1 Product Name	9	4.15 Headset path	101
2.2 Supporting Standard	9	4.16 Speaker path.....	103
2.3 Main Parts : GSM Solution.....	9	4.17 Main microphone	105
2.4 HW Features.....	10	4.18 Headset microphone.....	107
2.5 SW Features	12	5. DOWNLOAD	109
2.6 HW SPEC.....	19	6. BLOCK DIAGRAM.....	122
2.7 LG-A310 Figures.....	23	7. CIRCUIT DIAGRAM	131
3. TECHNICAL BRIEF	24	8. BGA Pin Map	143
3.1 RF GENERAL DESCRIPTION	24	9. PCB LAYOUT	149
3.2 GSM MODE.....	25	10. CALIBRATION.....	155
3.3 UMTS MODE	28	10.1 Usage of Tachyon for RF Calibration and Test	155
3.4 OFF-CHIP RF COMPONENTS	35	11. TEST MODE	158
3.5 OFF-CHIP COMPONENTS	38	12. EXPLODED VIEW & REPLACEMENT	
3.6 BB GENERAL DESCRIPTION.....	40	PART LIST	163
3.7 Power management.....	53	12.1 EXPLODED VIEW	163
3.8 SUB SYSTEM.....	57	12.2 Replacement Parts.....	165
4. TROUBLE SHOOTING	63	12.3 Accessory	179
4.1 RF Component.....	63		
4.2 RF Path	64		
4.3 Trouble Shooting of GSM Part.....	66		
4.4 Trouble Shooting of WCDMA part	73		
4.5 Checking Bluetooth Block	78		
4.6 BB Power ON Troubleshooting	83		
4.7 Charger Troubleshooting	86		
4.8 USB Troubleshooting	88		
4.9 USIM Troubleshooting.....	90		



1. INTRODUCTION

1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

1.2 Regulatory Information

A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system.

There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common carrier telecommunication service of facilities accessed through or connected to it. The manufacturer will not be responsible for any charges that result from such unauthorized use.

B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the phones or compatibility with the net work, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

D. Maintenance Limitations

Maintenance limitations on the phones must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

1. INTRODUCTION

F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

G. Interference and Attenuation

A phone may interfere with sensitive laboratory equipment, medical equipment, etc. Interference from unsuppressed engines or electric motors may cause problems.

H. Electrostatic Sensitive Devices

ATTENTION

Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the  sign. Following information is ESD handling:

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

APC	Automatic Power Control
BB	Baseband
BER	Bit Error Ratio
CC-CV	Constant Current – Constant Voltage
DAC	Digital to Analog Converter
DCS	Digital Communication System
dBm	dB relative to 1 milli watt
DSP	Digital Signal Processing
EEPROM	Electrical Erasable Programmable Read-Only Memory
ESD	Electrostatic Discharge
FPCB	Flexible Printed Circuit Board
GMSK	Gaussian Minimum Shift Keying
GPIO	General Purpose Interface Bus
GSM	Global System for Mobile Communications
IPUI	International Portable User Identity
IF	Intermediate Frequency
LCD	Liquid Crystal Display
LDO	Low Drop Output
LED	Light Emitting Diode
OPLL	Offset Phase Locked Loop

1. INTRODUCTION

PAM	Power Amplifier Module
PCB	Printed Circuit Board
PGA	Programmable Gain Amplifier
PLL	Phase Locked Loop
PSTN	Public Switched Telephone Network
RF	Radio Frequency
RLR	Receiving Loudness Rating
RMS	Root Mean Square
RTC	Real Time Clock
SAW	Surface Acoustic Wave
SIM	Subscriber Identity Module
SLR	Sending Loudness Rating
SRAM	Static Random Access Memory
PSRAM	Pseudo SRAM
STMR	Side Tone Masking Rating
TA	Travel Adapter
TDD	Time Division Duplex
TDMA	Time Division Multiple Access
UART	Universal Asynchronous Receiver/Transmitter
VCO	Voltage Controlled Oscillator
VCTCXO	Voltage Control Temperature Compensated Crystal Oscillator
WAP	Wireless Application Protocol

2. PERFORMANCE

2.1 Product Name

LG-A310 : WCDMA2100+EGSM/GSM850/DCS/PCS
(HSDPA 3.6Mbps / GPRS Class 12 / EDGE Class 12)

2.2 Supporting Standard

Item	Feature	Comment
Supporting Standard	WCDMA(FDD1)/EGSM/GSM850/DCS1800/PCS1900 with seamless handover Phase 2+(include AMR) SIM Toolkit : Class 1, 2, 3, C-E	
Frequency Range	WCDMA(FDD1) TX : 1920 – 1980 MHz WCDMA(FDD1) RX : 2110 – 2170 MHz EGSM TX : 880 – 915 MHz EGSM RX : 925 – 960 MHz GSM850 TX : 824 – 845 MHz GSM850 RX : 869 – 894 MHz DCS1800 TX : 1710 – 1785 MHz DCS1800 RX : 1805 – 1880 MHz PCS1900 TX : 1850 – 1910 MHz PCS1900 RX : 1930 – 1990 MHz	
Application Standard	WAP 2.0, JAVA 2.0	

2.3 Main Parts : GSM Solution

Item	Part Name	Comment
Digital Baseband	QSC6270 : Qualcomm	
Analog Baseband	QSC6270 : Qualcomm	
RF Chip	QSC6270 : Qualcomm	

2. PERFORMANCE

2.4 HW Features

Item		Feature	Comment
Form Factor		Slider type	
Battery		1) Capacity Standard : Li-Ion, 900mAh	
		2) Packing Type : Soft Pack	
Size		Standard : 98 X 47 X 15.2mm	
Weight		106g	With Battery
Volume		70cc	
PCB		staggered 10 Layers	
Stand by time		2G Up to 300 hrs 3G Up to 300 hrs	@ Paging Period 5 (2G) @ DRX 7 (3G)
Charging time		4 hrs	@ Power Off / 900mAh
Talk time		2G Up to 180mins 3G Up to 110 mins	@ Power Level 5 (2G) @ Tx = 12dBm (3G)
RX sensitivity		WCDMA(FDD1) : -106.7 dBm WCDMA(FDD8) : -103.7 dBm EGSM : -105 dBm DCS 1800 : -105 dBm PCS 1900 : -105 dBm	
TX output power	WCDMA/ GSM/ GPRS	WCDMA : 24dBm/3.84MHz,+1/-3dBm EGSM : 33dBm DCS 1800 : 30 dBm PCS 1900 : 30 dBm	Class3(WCDMA) Class4 (EGSM) Class1 (PCS) Class1 (DCS)
	EDGE	GSM 900 : 27 dBm DCS 1800 : 26 dBm PCS 1900 : 26 dBm	E2 (GSM900) E2 (PCS) E2 (DCS)
GPRS compatibility		GPRS Class 12	
EDGE compatibility		EDGE Class 12	
SIM card type		Plug-In SIM 3V /1.8V	
Display		2" TFT QCIF LCD	
Built-in Camera		2M CMOS Camera	
Status Indicator		Yes	
Keypad		Number of Keys : 15 Numeric Keys Volume control(2) Soft Function Keys : 2	
ANT		Main : Internal Fixed Type	
System connector		5 Pin	
Ear Phone Jack			
PC synchronization		Yes	
Memory		NAND Flash : 2Gbit SDRAM : 1Gbit	
Speech coding		FR, EFR, HR,AMR	

2. PERFORMANCE

Item	Feature	Comment
Data & Fax	Built in Data & Fax support	
Vibrator	Built in Vibrator	
Blue Tooth	V2.1,A2DP	
MIDI(for Buzzer Function)	SW Decoded 64Poly	
Music Player	MP3/AAC/AAC+/WMA	
Video Player	MPEG4, H.263 40fps@QVGA	
Camcorder	MPEG4, 15fps@QVGA	
Voice Recording	Yes	
Speaker Phone mode Support	Yes	
Travel Adapter	Yes	
CDROM	Yes	
Stereo Headset	Yes	
Data Cable	Yes	
T-Flash (External Memory)	Yes	

2. PERFORMANCE

2.5 SW Features

Function	Target Specification	Remark
Display	RSSI	7 Level
	Battery Charging	3 Level
	Multi-Language	YES
	PLMN/Service Indicator	YES
Speech Codec	FR/EFR/HR	YES
Keypad	Number of Keys : 15 Numeric Keys	YES
	Volume control(2)	YES
	Soft Function Keys : 2	YES
Camera	Photo size	1600x1200,1280x960 640x480,320x240, Wallpaper 176x144,contacts
	photo format	jpeg
	sensor,	2M CMOS Sensor
	video recording resolution	176X144, 128X96
	recording framerate	15fps
	previewing framerate	15fps
	recording bitrate	Audio : 12.2 Kbps Video : bit rate is variable depending on size or quality.
	recording video format	Video: H.263 Audio: AMR12.2 Kbps
Bluetooth	bluetooth profiles supported	SPP, DUN, HSP, HFP, OPP, FTP, A2DP, AVRCP,PBAP
Audio	Key Tone Volume	8 step 0~7level
	Key tone setting	No sound / sound1 / sound2 / sound3
	Ring Tone Volume	8 step 0~7 Level
	Vibrate alert	On/Off
	Ring Type:	Normal/ Silent/ Outdoor/ Flight mode/ Customised1,2,3
	Earpiece Volume	NO
	Mute	YES
Multi-Band	Support of Multi-band	GSM 850/900/1800/1900 3G 900/2100
Bearer	EGPRS	ClassB, Multi-slot class 12
	UMTS	Uplink Data Rate : up to 384 Kbps Downlink Data Rate : up to 384 Kbps
	HSDPA	Category 6 (3.6Mbps)
Data	Transparent Standard Asynchronous	NO

2. PERFORMANCE

Function	Target Specification	Remark
Normal Features	Missed Calls	YES
	Received Calls	YES
	Dialled Calls	YES
	All Calls	YES
	Call durations	YES
	Data Volume	YES
DTMF	DTMF Signalling	YES
Call Management	Call Divert	YES
	Call Waiting	YES
	Call Reject	YES
	Call Costs	YES
	Video Call(EU : not support, AU : support)	YES
	Send My Number	YES
	Auto Redial	YES
	Minute Reminder	YES
	Answer mode (Press send key/Slide up / Press any key)	YES
	BT answer mode	YES
	Save new number	YES
Call Cost	Last Call Units	YES
	Total Call Units	YES
	Visible Cost Indication	NO
Supplementary Services	Diverts Voice/Video calls(EU : not support, AU : support)	YES
	Diverts All calls	YES
	Diverts If busy	YES
	Diverts If no answer	YES
	Diverts If unreachable	YES
	Call Barring Voice/Video calls	YES
	Call Barring All Outgoing Calls	YES
	Call Barring All Outgoing International Calls	YES
	Call Barring All Outgoing International Calls except home country	YES
	Call Barring All incoming Calls	YES
	Call Barring All incoming Calls when abroad	YES
	Conference Call	YES
Network	Network Selection	Automatic/ Manual
	Location (Network) Mode Selection	YES
	Preferred Network (User definition)	YES

2. PERFORMANCE

Function	Target Specification	Remark
Phone Book	Phonebook in SIM	YES
	Phonebook in Phone	YES
	Search the Phone Book in call	YES
	Scroll by alpha or number	NO
	Copy & Move	YES
	Fixed Dial Number	YES
	Service Dial Number	YES
	Email Entry	YES
	Phonebook capacity on phone	Max. 1000
	Organisation by groups	YES
	One-touch dialing	NO
	Own number	YES
SIM	Service Provider Lock & Network Lock	YES
	SIM Toolkit	Class 1, 2, 3
	Prepaid SIM Operation	YES
	Read Message	YES (SMS)
Cell Broadcast	Read Cell Broadcast	2G only
	Cell Broadcast Channels	Read from USIM
	Cell Broadcast Message Language	Conform the phone language
	Cell Information	2G only
Message	SMS Standard	Basic text-only SMS as described in 3GPP TS 23.040 R5
	MMS Standard	3GPP Multimedia Messaging Service as described in the document 3GPP TS 23.140 R5.
	Email Standard	RFC1939(POP-ver3), RFC3501 (IMAP-ver4), RFC2821 (SMTP), RFC2822 (Internet message format)
	Single Inbox folder	YES
	Outbox folder	YES
	Email folder (Mailbox)	YES
	Write MMS Message	YES
	Write SMS Message	concatenated message : up to 7 pages
	Write Email Message	YES
	Templates support	YES
	Receive MMS message	MMS maximum message size : 300 Kb
	Read Message	SMS concatenated message : up to 20 pages
	Delete Message	YES
	Forward Message	SMS concatenated message : up to 7 pages
	Edit Message	YES

2. PERFORMANCE

Edit only conformance messages, unknown media not supported, unknown SMIL not supported	YES
Reply Message	YES
Send Message	YES
Store SMS Message	Max. 1000 (UE)
Extract media from Message	YES
Extract number / address / URL from text in message	YES
Call / Send message / Save from extract Number	YES
Send Message / Save from e-mail address	YES
Browse / Bookmark from URLs	YES
Insert Media into message	YES
OTA provisioning partially support (Network Profile setting)	YES
Message Delivery	
Auto download mode	YES
Manual download mode	YES
When in roaming, automatically Manual mode change	NO
Operator can pre-configure the delivery mode	YES
MMS notification with icon or Pop-up message display	YES
Support Character Sets	
ISO-8859-1	YES
US-ASCII	YES
UTF-8(SMS) / UTF-16(MMS)	YES
MMS Version	
OMA-MMS-CONF V1.2	YES (without MMBox)
OMA-MMS- CTR V1.2	YES (without MMBox)
MMS Text formats	
US-ASCII	YES
ISO-8859-1	YES
UTF-16	YES
MMS Images	
JPEG	YES
GIF87	YES
GIF89a	YES
PNG	YES
X-PNG	YES
WBMP	YES
BMP	YES
MMS Audio/Video	
AMR	YES

2. PERFORMANCE

	MIDI	YES
	MP3	YES
	WAV	YES
	MMF	YES
	WMA	YES
	WMV	YES
	AAC	YES
	AAC+	YES
	3GP	YES
	MP4	YES
	MMS SMIL	YES
	Audio/Video streaming	Streaming File played via MultiMedia Player
	Post Card	YES
	Voice message	YES
M-Service	Object Download : Pictures	N/A
	Object Download : Sound	N/A
	SAR	N/A
Miscellaneous Function	Field Test Facility	NO
	Display Software Version	YES
	IMEI	YES
	T9 (Predictive word input)	YES
Text Input	Language	YES
	English, Italian, German, French, Swedish, Danish	YES
	(It can be changed)	YES
	Predictive word input	YES
Date & Time	Setting Local time	YES
	Time format	12h/ 24h
	Auto update date/time	YES
	Daylight saving	YES
Organiser	Alarm	YES
	Calendar	YES
	Tasks	YES
	Memo	YES
	Voice recorder	YES
	Calculator	YES
	Converter	Currency/Surface/Length/Weight/Temperature/Volume/Velocit
	World time	YES
PC Sync	Phone Book Sync	YES
	Todo, Memo Sync	YES
	Scheduler Sync	YES
SyncML	version	1.1.2 / 1.2 (Server dependent)

2. PERFORMANCE

Function	Target Specification	Remark
External Interface	Development and Test Facility	NO
Handset	Read Software Version	YES
	Battery Charging Mode	YES
	Restore Factory Setting	YES
Security	Emergency Call	YES
	SIM Lock (Network Lock / Service Provider Lock is available)	YES
	Phone Lock	YES
	PIN code	YES
Browser	WAP version	2.0
	https: URI scheme support	YES
	XHTML-MP	YES
	SVG-T 1.1 (+opacity, +gradients)	YES
	4-way navigation	YES
	Stack used	HTTP, WSP dual
	Browser vender	Obigo(Teleca) Q07.x
	OMA client provisioning	Support
	WTAI	public support
	OMA D/L	OMA D/L 2.0 support
	WAP PUSH	SI, SL support
	Support of wml	WML 1.3 support
	WML script	Support
	XHTML	XHTML 1.1 support
	CHTML, IHTML	Not support
	HTML	HTML 4.01 support
	WCSS	Support
	OMA Download	version 2.0
Game	Vodafone default game	TBD
Java games & Apps: JTWI, JSR 184, JSR 82	VSCL	No
	JSR 82	YES
	JSR 135	YES
	JSR 118	YES
	JSR 120	YES
	JSR 184	YES
	JSR 139	YES
	MIDP version	2.1
	Accelerator	NO
	Java Connectivity	HTTP, HTTPS
	Heap size	Dynamic allocation within system heap
	CLDC version	1.1

2. PERFORMANCE

Function	Target Specification	Remark
DRM	OMA version	1,0
	FTMDv2.0	NO
MTV	Mobile TV	No
RDJ	Radio DJ	No
MTP	Media Transfer Protocol	Over Window Media 10
CPE	OMA Push EMN 1.0	YES
	E-Mail Account, E-Mail	5EA/300EA

2.6 HW SPEC.

1) GSM transceiver specification

Item	Specification
Phase Error	Rms : 5° Peak : 20°
Frequency Error	EGSM/GSM850 : 0.1 ppm DCS/PCS : 0.1 ppm
EMC(Radiated Spurious Emission Disturbance)	GSM/DCS : < -28dBm
Transmitter Output power and Burst Timing	EGSM/GSM850 : 5dBm – 33dBm ± 3dB DCS/PCS : 0dBm – 30dBm ± 3dB
Burst Timing	<3.69us
Spectrum due to modulation out to less than 1800kHz offset	200kHz : -36dBm 600kHz : -51dBm/-56dBm
Spectrum due to modulation out to larger than 1800kHz offset to the edge of the transmit band	GSM : 1800-3000kHz : < -63dBc(-46dBm) 3000kHz-6000kHz : < -65dBc(-46dBm) 6000kHz < : < -71dBc(-46dBm) DCS : 1800-3000kHz : < -65dBc(-51dBm) 6000kHz < : < -73dBc(-51dBm)
Spectrum due to switching transient	400kHz : -19dBm/-22dBm(5/0), -23dBm 600kHz : -21dBm/-24dBm(5/0), -26dBm
Reference Sensitivity – TCH/FS	Class II(RBER) : -105dBm(2.439%)
Usable receiver input level range	0.012(-15 - -40dBm)
Intermodulation rejection – Speech channels	± 800kHz, ± 1600kHz : -98dBm/-96dBm (2.439%)
AM Suppression – GSM : -31dBm – DCS : -29dBm	-98dBm/-96dBm (2.439%)
Timing Advance	± 0.5T

2. PERFORMANCE

2) WCDMA transmitter specification

Item	Specification
Transmit Frequency	Band1 : 1920 MHz ~ 1980 MHz
Maximum Output Power	+24 dBm / 3.84 MHz, +1 / -3 dB
Frequency Error	within ± 0.1 PPM
Open Loop Power Control	Normal Conditions : within ± 9 dB, Extreme Conditions : within ± 12 dB
Minimum Transmit Power	< -50 dBm / 3.84 MHz
Occupied Bandwidth	< 5 MHz at 3.84 Mcps (99% of power)
Adjacent Channel Leakage Power Ratio (ACLR)	> 33 dB @ ± 5 MHz, > 43 dB @ ± 10 MHz
Spurious Emissions $ f-f_c > 12.5$ MHz	< -36 dBm / 1 kHz RW @ $9 \text{ kHz} \leq f < 150 \text{ kHz}$ < -36 dBm / 10 kHz RW @ $150 \text{ kHz} \leq f < 30 \text{ MHz}$ < -36 dBm / 100 kHz RW @ $30 \text{ MHz} \leq f < 1 \text{ GHz}$ < -30 dBm / 1 MHz RW @ $1 \text{ GHz} \leq f < 12.75 \text{ GHz}$ < -60 dBm / 3.84 MHz RW @ $869 \text{ MHz} \leq f \leq 894 \text{ MHz}$ < -60 dBm / 3.84 MHz RW @ $1930 \text{ MHz} \leq f \leq 1900 \text{ MHz}$ < -60 dBm / 3.84 MHz RW @ $2110 \text{ MHz} \leq f \leq 2155 \text{ MHz}$ < -67 dBm / 100 kHz RW @ $925 \text{ MHz} \leq f \leq 935 \text{ MHz}$ < -79 dBm / 100 kHz RW @ $935 \text{ MHz} < f \leq 960 \text{ GHz}$ < -71 dBm / 100 kHz RW @ $1805 \text{ MHz} \leq f \leq 1880 \text{ MHz}$ < -41 dBm / 300 kHz RW @ $1884.5 \text{ MHz} < f < 1919.6 \text{ MHz}$
Transmit Intermodulation	< -31 dBc @ 5 MHz & < -41 dBc @ 10 MHz when Interference CW Signal Level = -40 dBc
Error Vector Magnitude	< 17.5 %, when Pout $\geq$ -20 dBm
Peak Code Domain Error	< -15 dB at Pout $\geq$ -20 dBm

3) WCDMA receiver specification

Item	Specification																			
Receive Frequency	Band1 : 2110 ~ 2170 MHz																			
Reference Sensitivity Level	Band1 : BER < 0.001 when $\hat{I}_{or}$ = -106.7 dBm / 3.84 MHz																			
Maximum Input Level	BER < 0.001 when $\hat{I}_{or}$ = -25 dBm / 3.84 MHz																			
Adjacent Channel Selectivity (ACS)	ACS > 33 dB where BER < 0.001 when $\hat{I}_{or}$ = -92.7 dBm / 3.84 MHz & I_{oac} = -52 dBm / 3.84 MHz @ ± 5 MHz																			
Blocking Characteristic	BER < 0.001 when $\hat{I}_{or}$ = -103.7 dBm / 3.84 MHz & $I_{blocking}$ = -56 dBm / 3.84 MHz @ $F_{uw}(\text{offset}) = \pm 10$ MHz or $I_{blocking}$ = -44 dBm / 3.84 MHz @ $F_{uw}(\text{offset}) = \pm 15$ MHz																			
Spurious Response	BER < 0.001 when $\hat{I}_{or}$ = -103.7 dBm / 3.84 MHz & $I_{blocking}$ = -44 dBm																			
Intermodulation	BER < 0.001 when $\hat{I}_{or}$ = -103.7 dBm / 3.84 MHz & I_{ouw1} = -46 dBm @ $F_{uw1}(\text{offset}) = \pm 10$ MHz & I_{ouw2} = -46 dBm / 3.84 MHz @ $F_{uw2}(\text{offset}) = \pm 20$ MHz																			
Spurious Emissions	< -57 dBm / 100 kHz BW @ $9 \text{ kHz} \leq f < 1 \text{ GHz}$ < -47 dBm / 1 MHz BW @ $1 \text{ GHz} \leq f \leq 12.75 \text{ GHz}$																			
Inner Loop Power Control In Uplink	Adjust output(TPC command) <table><tr><td>cmd</td><td>1dB</td><td>2dB</td><td>3dB</td></tr><tr><td>+1</td><td>+0.5/1.5</td><td>+1/3</td><td>+1.5/4</td></tr><tr><td>0</td><td>-0.5/+0.5</td><td>-0.5/+0.5</td><td>-0.5/+0.5</td></tr><tr><td>-1</td><td>-0.5/-1.5</td><td>-1/-3</td><td>-1.5/-4</td></tr></table> group(10equal command group) <table><tr><td>+1</td><td>+8/+12</td><td>+16/+24</td></tr></table>	cmd	1dB	2dB	3dB	+1	+0.5/1.5	+1/3	+1.5/4	0	-0.5/+0.5	-0.5/+0.5	-0.5/+0.5	-1	-0.5/-1.5	-1/-3	-1.5/-4	+1	+8/+12	+16/+24
cmd	1dB	2dB	3dB																	
+1	+0.5/1.5	+1/3	+1.5/4																	
0	-0.5/+0.5	-0.5/+0.5	-0.5/+0.5																	
-1	-0.5/-1.5	-1/-3	-1.5/-4																	
+1	+8/+12	+16/+24																		

2. PERFORMANCE

4) HSDPA transmitter specification

Item	Specification				
Transmit Frequency	Band1 : 1920 MHz ~ 1980 MHz				
Maximum Output Power	Sub-Test 1=1/15, 2=12/15 21~25dBm / 3.84 MHz 3=13/15 4=15/8 20~25dBm / 3.84 MHz 5=15/7 6=15/0 19~25dBm / 3.84 MHz				
HS-DPCCH	Sub-test in table C.10.1.4	Power step	Power step slot boundary	Power step size, P [dB]	Transmitter power step tolerance [dB]
	5	1	Start of Ack/Nack	6	+/- 2.3
		2	Start of CQI	1	+/- 0.6
		3	Middle of CQI	0	+/- 0.6
Spectrum Emission Mask	Sub-Test : 1=1/15, 2=12/15, 3=13/15, 4=15/8, 5=15/7, 6=15/0				
	Frequency offset from carrier Δf		Minimum requirement		Measurement Bandwidth
	2.5 ~ 3.5 MHz		$-35-15\times(\Delta f-2.5)\text{dBc}$		30 kHz
	3.5 ~ 7.5 MHz		$-35-1\times(\Delta f-3.5)\text{dBc}$		1 MHz
	7.5 ~ 8.5 MHz		$-35-10\times(\Delta f-7.5)\text{dBc}$		1 MHz
	8.5 ~ 12.5 MHz		-49dBc		1 MHz
Adjacent Channel Leakage Power Ratio (ACLR)	Sub-Test : 1=1/15, 2=12/15, 3=13/15, 4=15/8, 5=15/7, 6=15/0 > 33 dB @ ± 5 MHz > 43 dB @ ± 10 MHz				
Error Vector Magnitude	< 17.5 %, when Pout $\geq$ -20 dBm				

5) HSDPA receiver specification

Item	Specification
Receive Frequency	Band1 : 2110 ~ 2170 MHz
Maximum Input Level (BLER or R), 16QAM Only	Sub-Test : 1=1/15, 2=12/15, 3=13/15, 4=15/8, 5=15/7, 6=15/0 BLER < 10% or R $\geq$ 700kbps

2.7 LG-A310 Figures



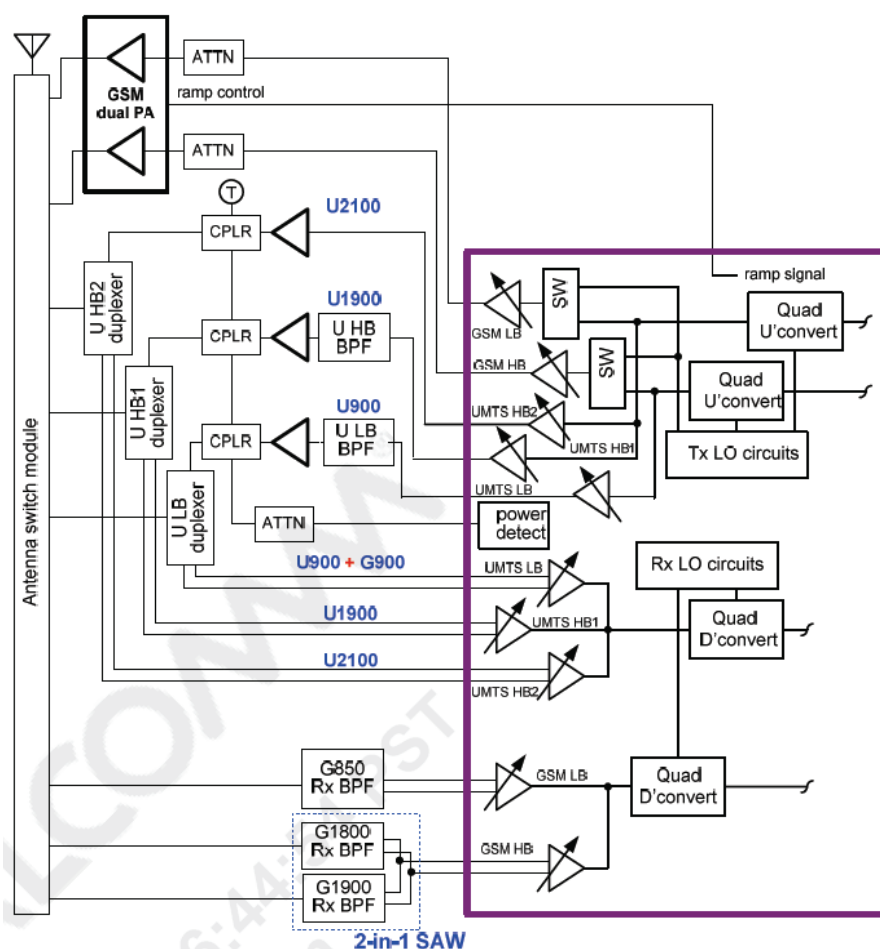
3. TECHNICAL BRIEF

3. TECHNICAL BRIEF

3.1 RF GENERAL DESCRIPTION

The RF platform of LG-A310 supports two different communication modes (WCDMA/GSM modes) including five communication bands (W2100/GSM850/GSM900/GSM1800/GSM1900). The all the RF blocks can be divided into three main parts, which are a WCDMA part, a GSM, and an antenna switch Mode.

The simplified block diagram is shown in Figure 1.1.1i



[Figure 1-1] Block diagram of RF part

3.2 GSM MODE

The EDGE/GPRS/GSM transceiver use a digital interface that is shared between receive and transmit data.

The receive interface is based on I and Q data and the transmitter interface is based on envelop and frequency data.

The quad band EDGE/GSM/GPRS transceiver has the following general features:

Power class

GMSK low bands: Class 4 (33 dBm)

GMSK high bands: Class 1 (30 dBm)

8PSK low bands: Class E2 (27 dBm)

8PSK high bands: Class E2 (26 dBm)

Multi slot class 12 (4+4=5)

Dual Transfer Mode (DTM) class 9 (3+2=5)

Zero-IF receiver

-Polar modulation transmitter

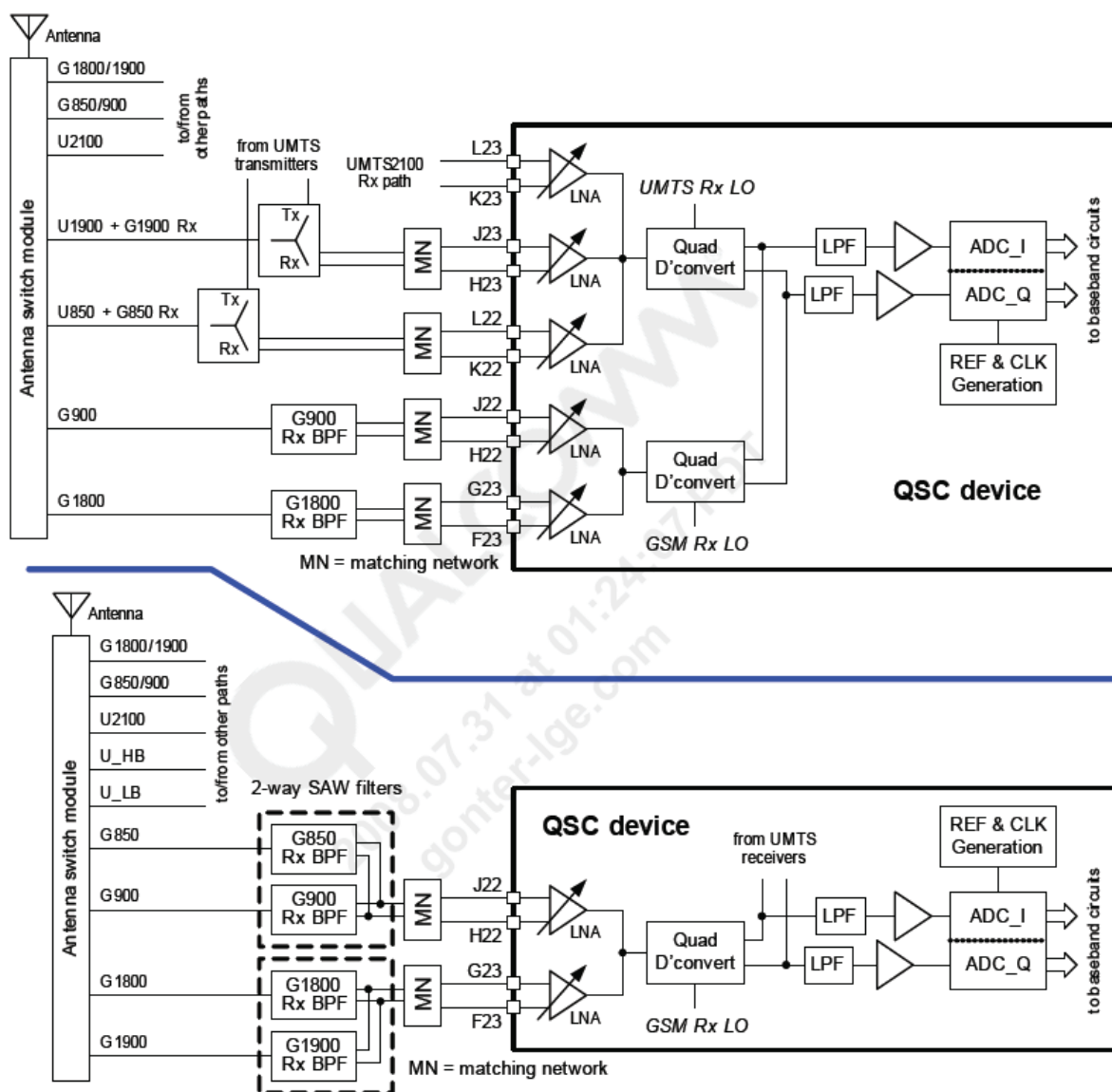
3. TECHNICAL BRIEF

3.2.1 GSM RECEIVER

There are two recommended GSM receiver path configurations; both are shown in Figure 1.3.2.1.

The configuration shown on top allows the GSM 850 and GSM 1900 bands to share the UMTS 850 and UMTS 1900 paths for US applications and uses four LNA inputs to support quad-band GSM operation.

The lower example uses two LNAs for quad-band GSM operation (one low band and one high band), with two-way SAW filters between the antenna switch and the QSC inputs for each band type.



[Figure 1-2] QSC GSM receiver signal paths functional diagram

3.2.2 GSM TRANSMITTER

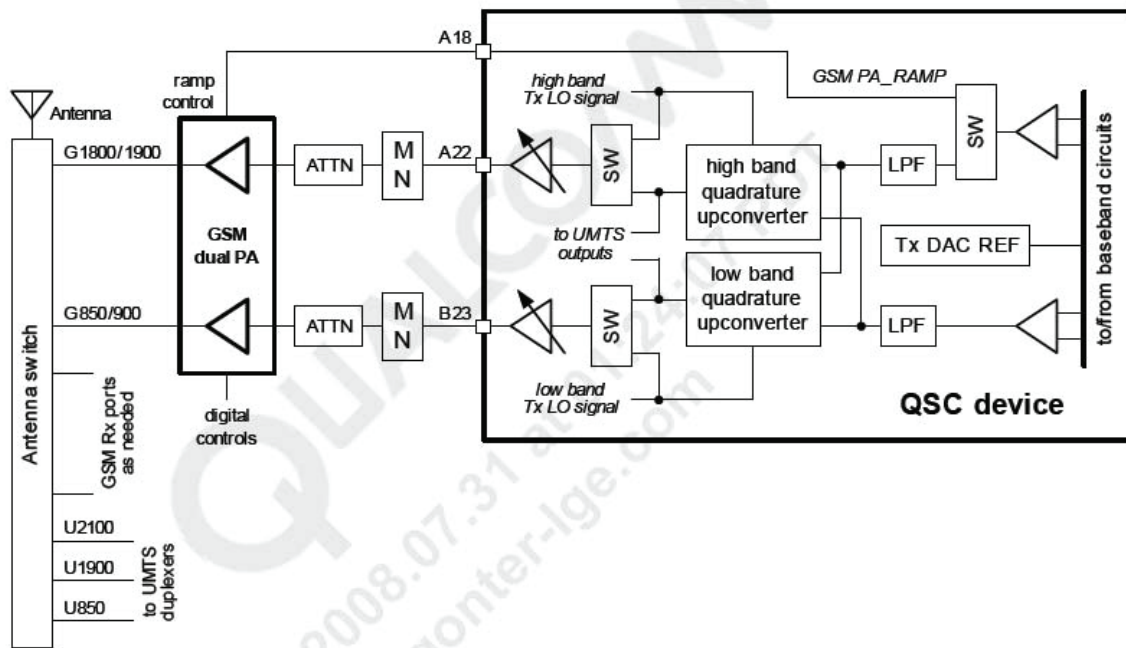
The QSC62x0 device supports quad-band GSM transmissions with two separate dual-band driver amplifier outputs; in fact, most Tx active circuits are contained within the device.

Both GSM transmit paths (Figure 1.3.1.1) begin with a single, shared analog baseband signal from the device's baseband circuits - the same interface and baseband circuits used by the UMTS transmitters. The GSM transmitters use the same quadrature upconverters as well

- one for low band signals and one for high band —with just one active at a time. The transmitter LO signals are generated by circuits described in next section and delivered to the upconverter circuits at the correct frequency, with the proper phase relationship, and with an adequate drive level.

The SPDT switches at each driver amplifier input allow selection of the output signal: either the actual GSM signal from the upconverter or a test signal generated by the Tx LO synthesizer. The Tx output chain is functionally identical for both the low band and the high band: the power amplifier is driven by the QSC device through a matching network and a resistive attenuator; the PA output is routed to the antenna switch module whose output is connected to the antenna. In addition to the through signal path, the QSC device also provides the PA ramp control signal that ensures smooth transitions while the transmitter is turned on and off for GSM's burst transmissions.

The ramp signal is generated by one of the baseband circuit's Tx DACs. A switch after the baseband amplifier selects whether the DAC output signal is routed to GSM PA module for ramping the PA up or down, or to the transmitter signal path for transmission.



[Figure 1.2.2] QSC GSM transmitter signal paths functional diagram

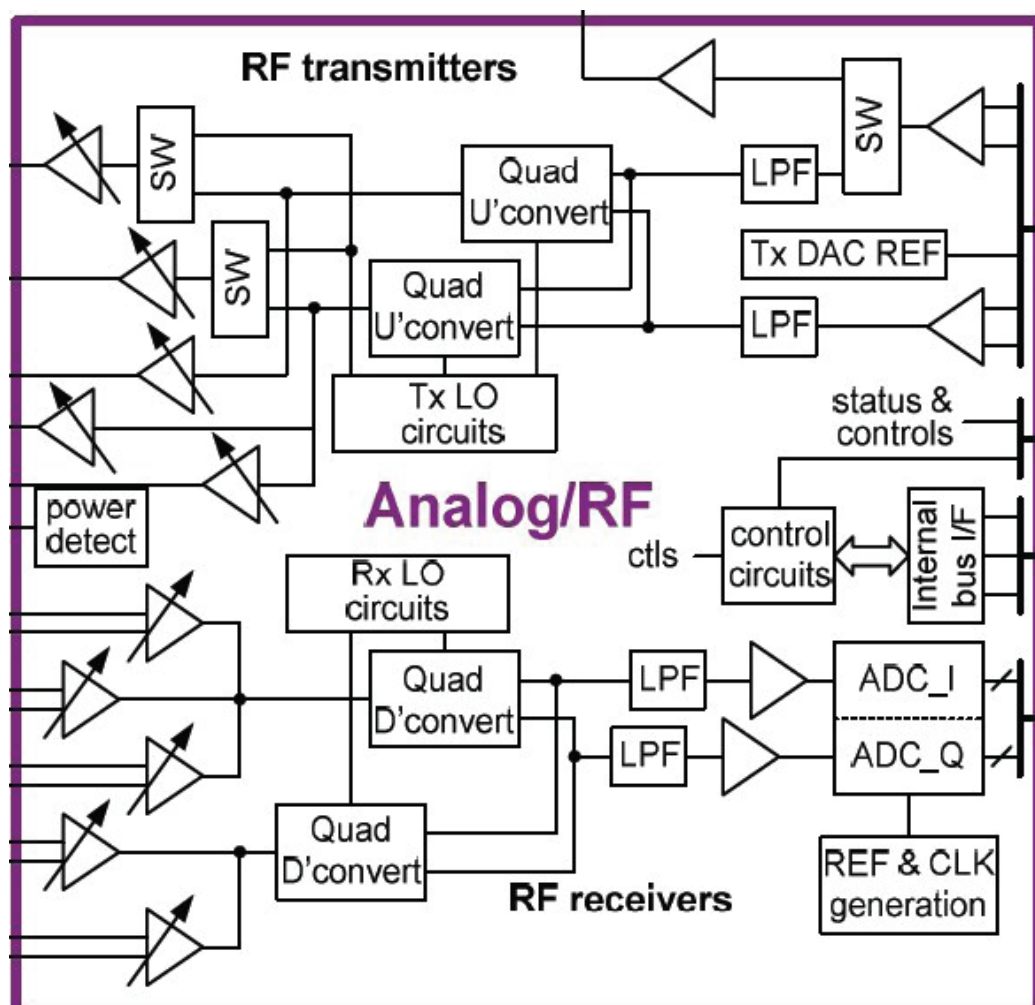
3. TECHNICAL BRIEF

3.3 UMTS MODE

The W-CDMA transceiver uses differential analog in-phase and quadrature-phase interfaces, That is an IQ-interface, both in the receiver and transmitter information path..

The transceiver has the following general features:

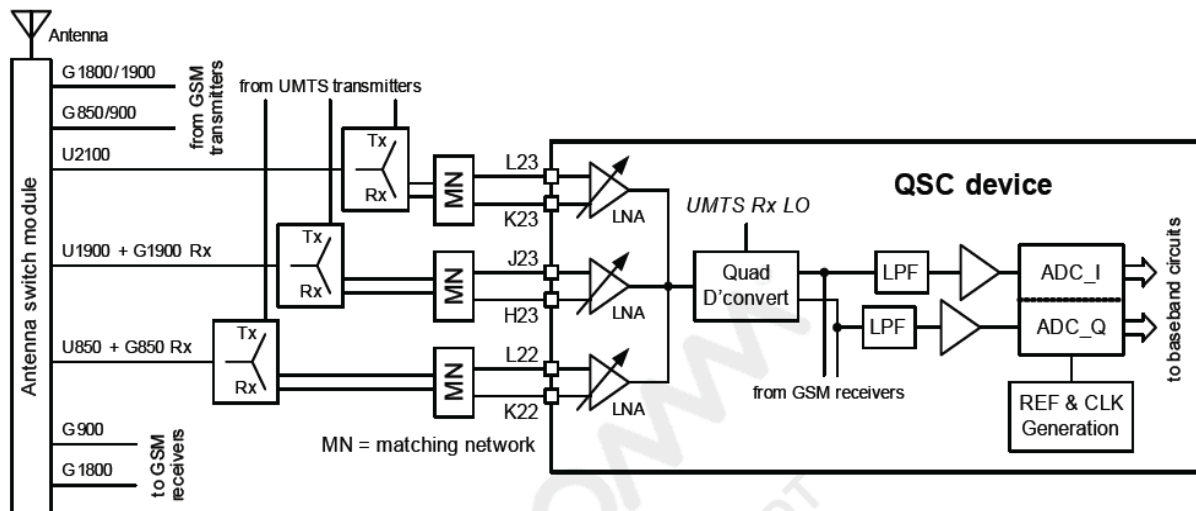
- . Power class : Power class 3 (+24dBm) in Band I and V
- . Zero-IF Receiver.NoIF filter needed
- . Direct IQ modulation transmitter



[Figure 1.3.1] WCDMA RF structure

3.3.1 UMTS RECEIVER

The antenna collects the base station forward-link signal and radiates the phone's reverse-link signal. In the example of a multiband, multimode phone (Figure 1.2.2.1), a switch routes the antenna signals to one of the three UMTS Rx/Tx paths, each beginning with its own band-specific duplexer that separates that band's receive and transmit paths



[Figure 1.3.2] WCDMA Receiver schematic

3. TECHNICAL BRIEF

Each UMTS duplexer provides a differential output signal that is compatible with its QSC LNA input. The duplexer-to-LNA interface requires a differential matching network (MN) that optimizes the power transfer into the LNA. Although there are three UMTS LNAs, only one is active at a time. The active gain-stepped LNA output drives a shared quadrature

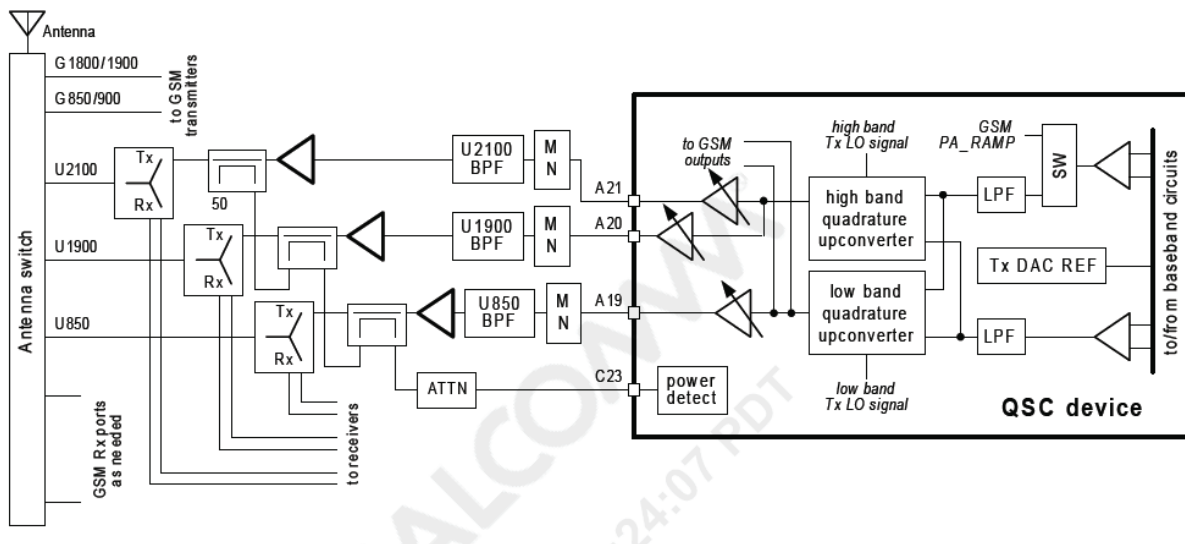
Downconverter directly—an off-chip inter-stage filter is not required. The elimination of this filter is achieved by a combination of factors:

- New on-chip QSC processing
- Higher performance achieved by the differential duplexer-to-LNA interface
- Greater duplexer suppression of Tx leakage

The downconverter's SRF circuitry includes another gain-stepped amplifier that supplements the LNA gain steps to further extend the receiver dynamic range. The downconverter translates the active LNA's SRF signal directly to baseband, producing two analog outputs: in-phase (I) and quadrature (Q). The UMTS baseband signals are routed to lowpass filters whose passband and stopband characteristics are optimized for the active WCDMA waveform. Both filter outputs are buffered to drive their analog-to-digital converters for digitization. The digital baseband outputs are routed to QSC baseband circuits for further processing.

3.3.2 UMTS TRANSMITTER

The QSC62x0 device support tri-band UMTS transmissions with three separate driver amplifier outputs; in fact, most Tx active circuits are contained within the device. All three UMTS transmit paths (Figure 1.2.1.1) begin with a single, shared analog baseband signal from the device's baseband circuits. The baseband signal is composed of two differential lines, one in-phase component and one quadrature-phase component. Each component is lowpassfiltered and amplified to levels sufficient for driving the quadrature upconverters. There are two upconverters—one for low-band signals and one for high band—but only one upconverter is active at a time.



[Figure 1.3.3] WCDMA Transceiver Architecture

3. TECHNICAL BRIEF

Each UMTS duplexer provides a differential output signal that is compatible with its QSC LNA input. The duplexer-to-LNA interface requires a differential matching network (MN) that optimizes the power transfer into the LNA. Although there are three UMTS LNAs, only one is active at a time. The active gain-stepped LNA output drives a shared quadrature downconverter directly - an off-chip inter-stage filter is not required. The elimination of this filter is achieved by a combination of factors:

- New on-chip QSC processing
- Higher performance achieved by the differential duplexer-to-LNA interface
- Greater duplexer suppression of Tx leakage. The downconverter's RF circuitry includes another gain-stepped amplifier that supplements the LNA gain steps to further extend the receiver dynamic range. The downconverter translates the active LNA's RF signal directly to baseband, producing two analog outputs: in-phase (I) and quadrature (Q). The UMTS baseband signals are routed to lowpass filters whose passband and stopband characteristics are optimized for the active WCDMA waveform. Both filter outputs are buffered to drive their analog-to-digital converters for digitization. The digital baseband outputs are routed to QSC baseband circuits for further processing.

3.6.7 Multimedia

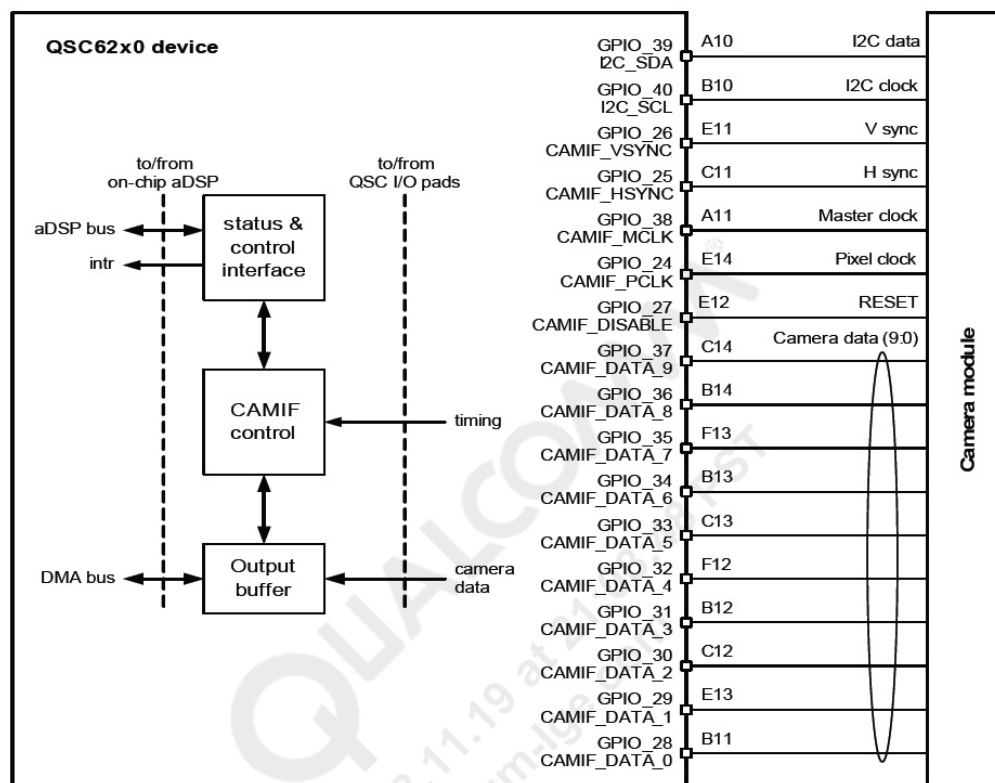
Multimedia topics are as below in QSC6270, including:

- ☐ Camera interface and video front-end
- ☐ Mobile display processor
- ☐ Additional multimedia support: video, audio, graphics, and messaging

3.6.7.1 Camera interface and video front-end

The camera interface (CAMIF) connects the QSC62x0 device directly to a camera sensor. Typical applications include Qcamera, Qcamcorder, and Qvideophone. The CAMIF delivers the raw 10-bit Bayer pattern data (preferred) to the video front-end (VFE) that performs the required image processing (RGB-triplet generation, color-space conversion, auto-white balance, auto exposure, gamma correction, etc.) and prepares the image for capture or transmission. The QSC device also supports a YUV 4:2:2 input from the sensor (8-bit, 2:1 MUX YUV or CCIR656 YUV).

The video capabilities of the two QSC devices varies slightly, with the QSC6270 providing higher performance than the QSC6270 device — greater resolution, higher capture and streaming rates, etc.



3. TECHNICAL BRIEF

Dedicated GSM configuration (two GSM LNAs)

In this configuration, the GSM 850 and GSM 1900 bands do not pass through the UMTS duplexers. Instead, the two GSM LNA inputs are shared: the GSM 850 and GSM 900 bands share the low-band GSM LNA, and the GSM 180 and GSM 190 bands share the high-band LNA. Four switch module outputs are required, each driving its own GSM Rx path. A two-way SAW filter takes the two low-band (or high-band) single-ended inputs from the antenna switch and provides one filtered, differential output that drives the appropriate QSC LNA input.

Beyond the LNA inputs, this GSM receiver configuration is identical to the paths described earlier for the shared UMTS/GSM configuration.

3.3.3. Rx LO circuits

The QSC62x0 device integrates all of the frequency synthesizer functions that generate the UMTS and GSM receive LO signals (UHF local oscillator, PLL circuits, and loop filter), plus the distribution circuits that deliver the quadrature LO signals to the two downconverters.

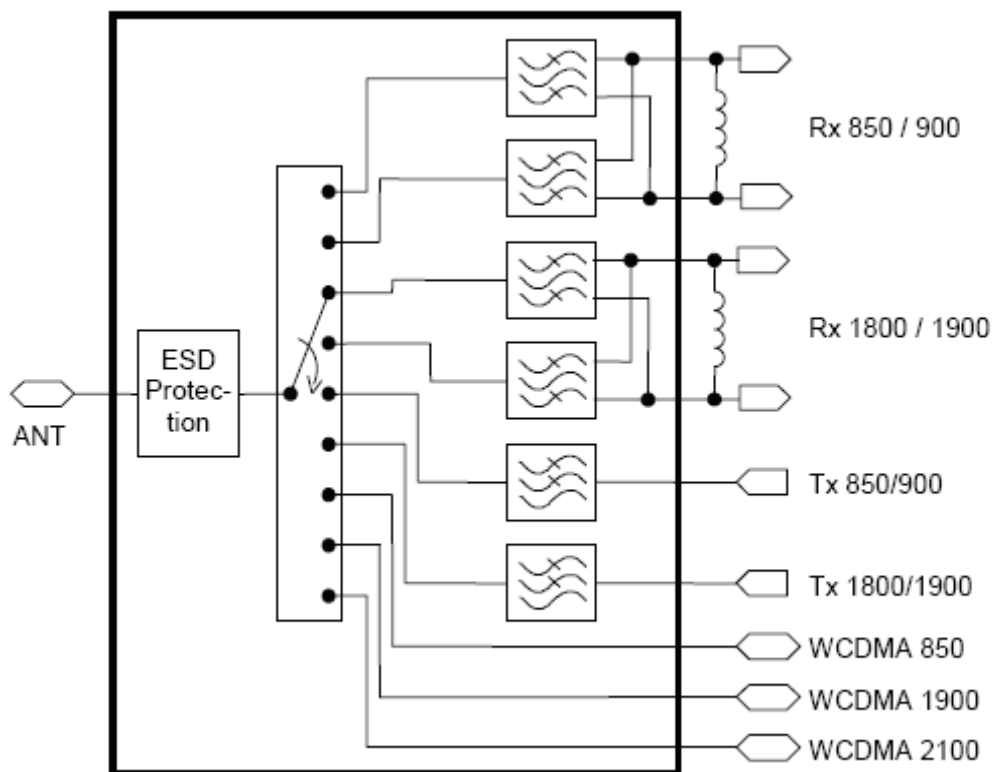
The buffered 19.2 MHz TCXO or XO signal provides the synthesizer input (REF), the frequency reference to which the PLL is phase and frequency locked. The reference is divided to create a fixed frequency input to the phase detector, FR. The other phase detector input (FV) varies as the loop acquires a lock and is generated by dividing the local oscillator output frequency using the feedback path's counter. The closed-loop will force FV to equal FR when locked.

If the loop is not locked, the error between FV and FR will create an error signal. This error signal is filtered by the loop filter and applied to the local oscillator, tuning the output frequency so that the error is decreased. Ultimately the loop forces the error to approach zero and the PLL is phase and frequency locked.

3.4 OFF-CHIP RF COMPONENTS

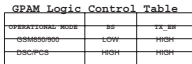
3.4.1 D5024 (FL100: FEM)

- Low-loss SAW frontend module for mobile telephone systems
- Covering GSM850, GSM900, GSM1800, GSM1900, WCDMA 2100 bands
- Integration of TX low pass filters, switches and decoder
- Integration of GSM 850, EGSM, PCN and PCS RX SAWs
- Balanced outputs of all RX ports, diplexed for GSM 850/ EGSMa and DCS/PCS
- Integration of ESD protection at Ant port to 8kV
acc. IEC-61000-4-2 (contact discharge)



[Figure 1.4.1] Block diagram of FEM

The dual band PA is operating to transmit for low band (GSM-850, GSM-900) and high band (GSM-1800, GSM1900). Operating mode is selected and controlled by the QSC6270.(GSM_PA_BAND)



[Figure 1.4.3] GSM850/GSM900 /DCS/PCS TX Power Amplifier path

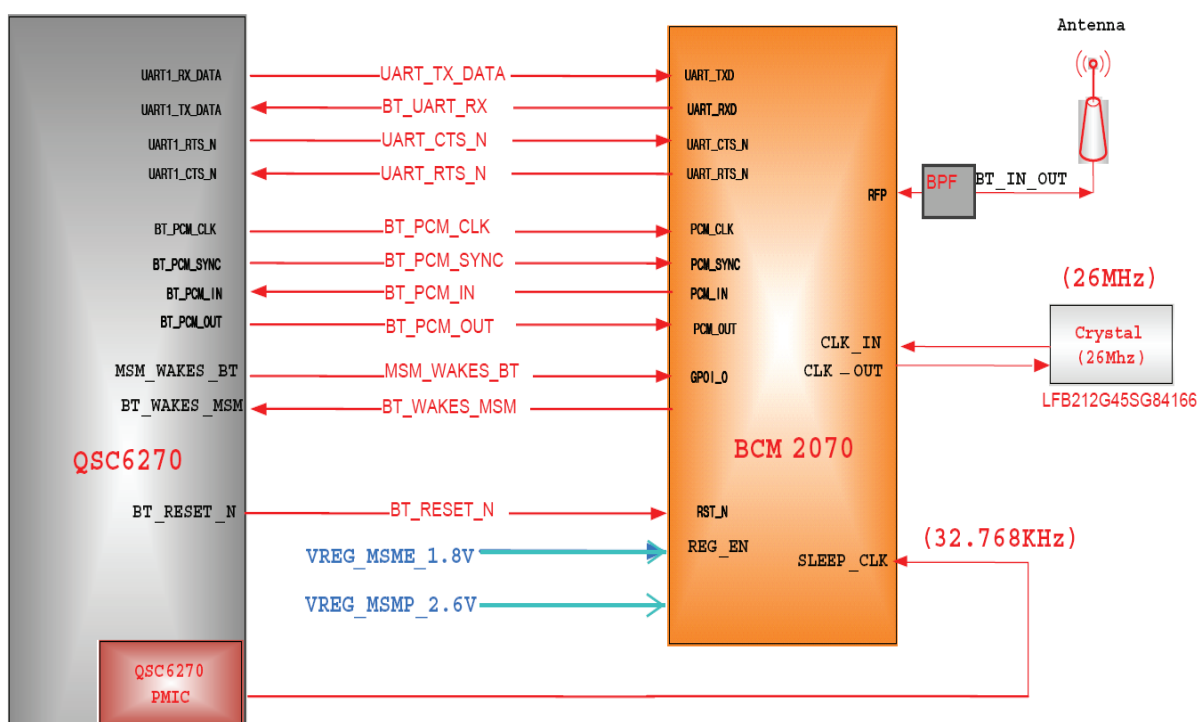
3. TECHNICAL BRIEF

3.5 OFF-CHIP COMPONENTS

3.5.1 Bluetooth (BCM2070)

Bluetooth block of LG-A310 consists of a BCM2070 chip-set, an external crystal oscillator(26MHz), and a Bluetooth chip antenna (2.4GHz). QSC6270, which is main HW solution of LG-A310 Model, doesn't include BT baseband core. Instead, Bluetooth chipset, BCM2070, contains stand-alone baseband processor (V2.1+EDR) as well as BT RF block. An external crystal oscillator (26MHz) is used to provide reference frequency to BCM2070.

Figure 1 shows the Bluetooth system architecture in the LG-A310.



[Figure 1.5] Bluetooth system architecture

3. TECHNICAL BRIEF

Pin name/function	Pin #	Pad group	Pad type ¹	Drive current ²	Functional description
BT_PWR_ON (GPIO_76)	AB1	P1 (1.8 V)	DO	1-8 (1)	Poweron signal for the Bluetooth device
BT_WAKES_MSM (GPIO_74)	AA3	P1 (1.8 V)	DI	–	BT signal to wake up the MSM (QSC)
MSM_WAKES_BT (GPIO_75)	AB2	P1 (1.8 V)	DO	1-8 (1)	Signal to wake up the Bluetooth device
XO_EN_GP1	W11	–	DO	–	Clock request from Bluetooth device
XO_OUT_GP1	W10	–	DO	–	Master clock to Bluetooth device
SLEEP_CLK	V12	–	DO	–	Sleep clock to Bluetooth device
UART1_RXD	E10	P5 (1.8 V)	DI (HV)	–	HS UART receive data from BT device
UART1_TXD	C10	P5 (1.8 V)	DO	1-8 (1)	HS UART transmit data to BT device
UART1_RFR_N (GPIO_8)	F11	P5 (1.8 V)	DO	1-8 (1)	HS UART ready for receive to BT device
UART1_CTS_N (GPIO_7)	F10	P5 (1.8 V)	DI	–	HS UART clear to send from BT device
AUX_PCM_DOUT (GPIO_21)	E9	P5 (1.8 V)	B	1-8 (1)	Bluetooth PCM I/F data out (if QSC master)
AUX_PCM_DIN (GPIO_20)	B8	P5 (1.8 V)	B	1-8 (1)	Bluetooth PCM I/F data in (if QSC master)
AUX_PCM_CLK (GPIO_22)	C8	P5 (1.8 V)	B	1-8 (1)	Clock for Bluetooth PCM interface
AUX_PCM_SYNC (GPIO_19)	A8	P5 (1.8 V)	B	1-8 (1)	Bluetooth PCM interface sync

1. The parameters listed under the Pad type column are defined in the QSC6240/QSC6270 Qualcomm Single Chip

Table 1. Bluetooth Connection(GPIO) with QSC6270

3. TECHNICAL BRIEF

3.6 BB GENERAL DESCRIPTION

QSC6270 has all eight major functional blocks as like Figure 2.1

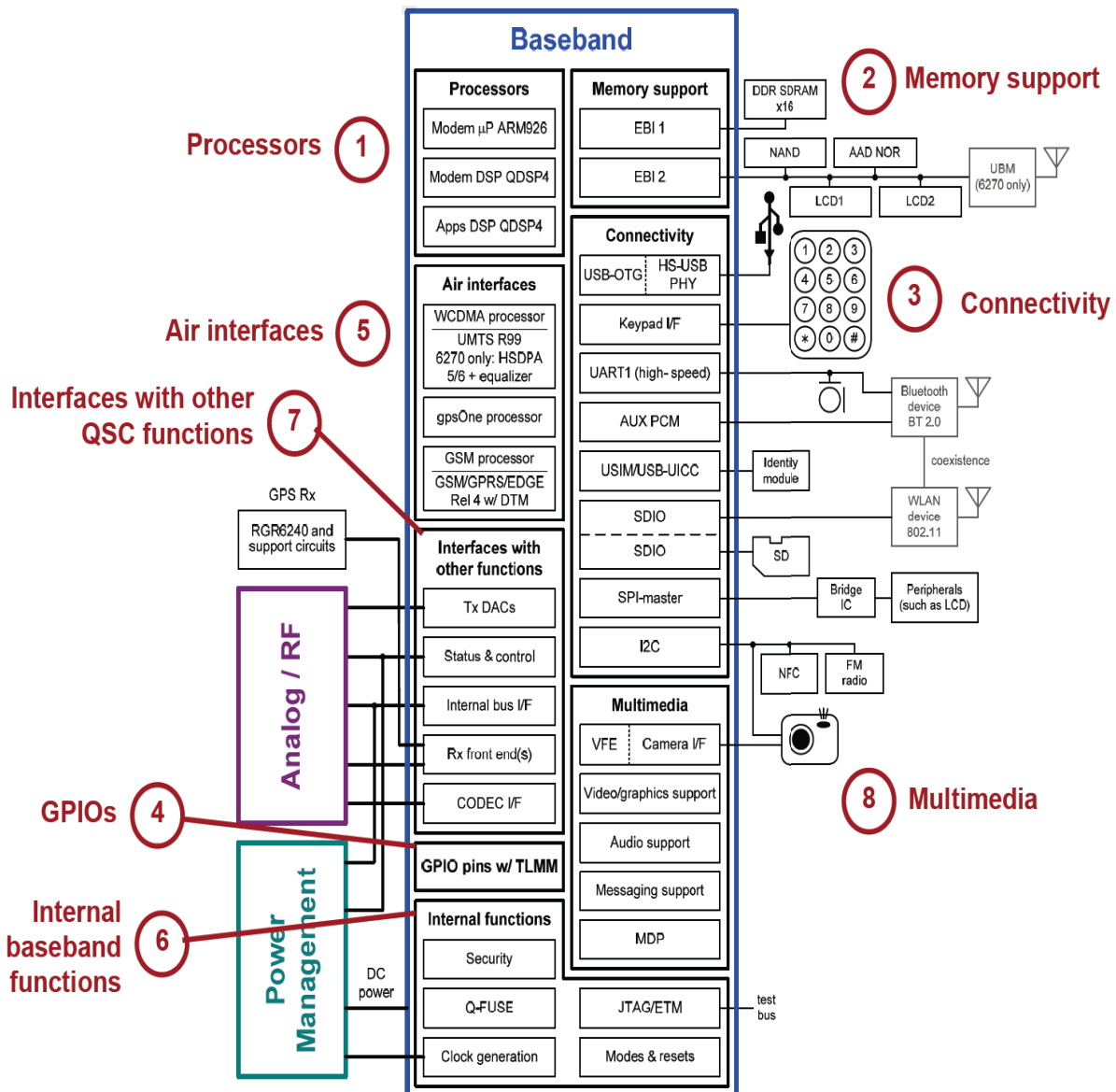


Figure 2.1 QSC6270 Base band block

3.6.1 Processor

The QSC6270 device integrates multiple processors on-chip: one ARM microprocessor and two DSP processors. Each processor is part of a functional subsystem:

- The micro subsystem includes the ARM926EJ-S microprocessor.
- The modem subsystem includes the QDSP4u8 digital signal processor (mDSP).
- The application subsystem includes the QDSP4u8 application digital signal processor (aDSP).

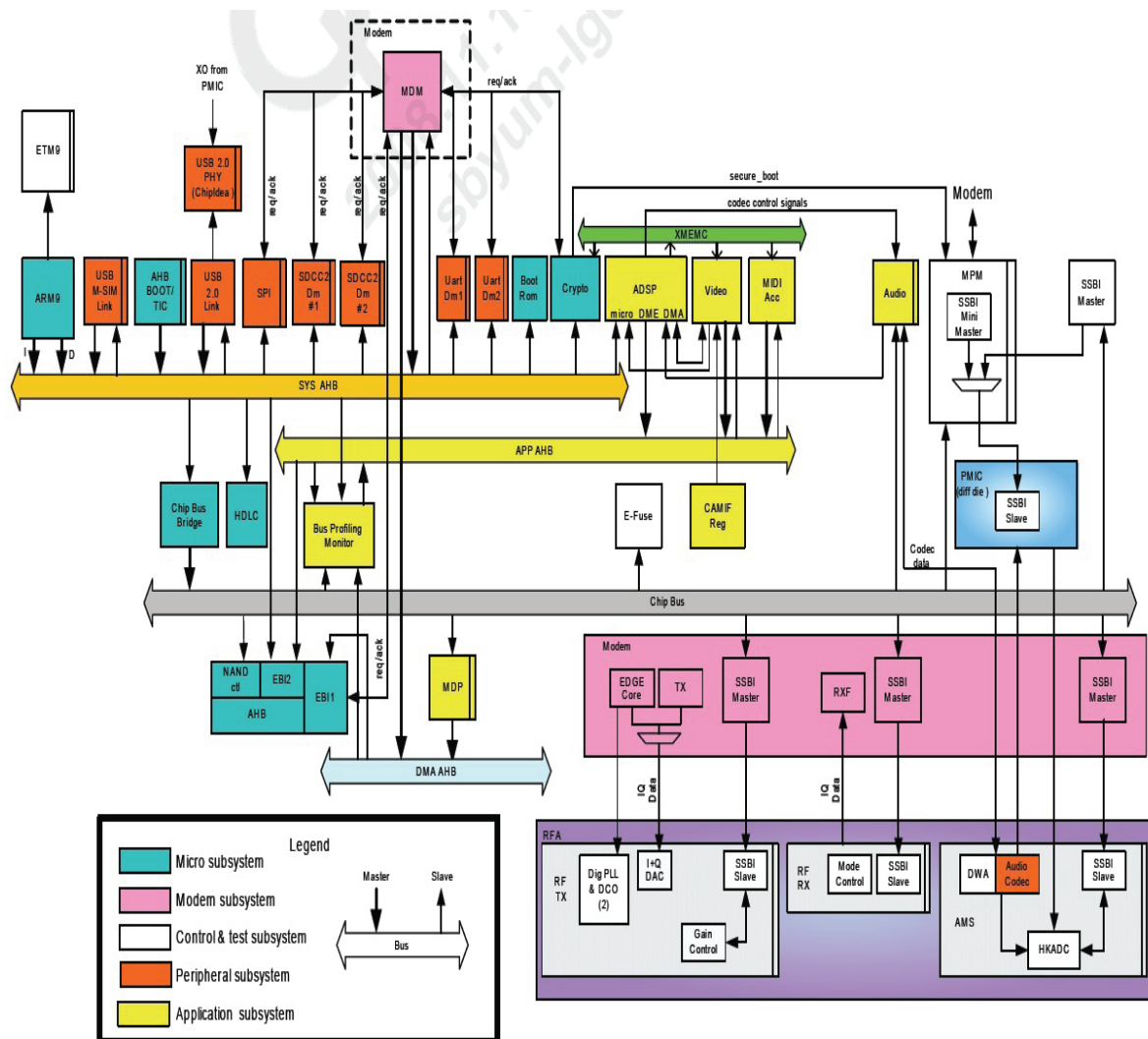


Figure 2.1.1 Processors and bus architecture

3. TECHNICAL BRIEF

3.6.2 Memory support (and LCD interface)

The QSC62x0 device has two external bus interface (EBI) ports: EBI1 and EBI2.

EBI1 supports high-speed synchronous dynamic devices. Its memory controller supports the new mobile DDR SDRAM memories with its higher bandwidth and ability to run at high clock frequencies. This interface supports the high-bandwidth, high-density, and low-latency requirements of the QSC's advanced on-chip capabilities such as the ARM9 processor, highperformance graphics, and video applications.

EBI2 is the slower speed interface intended to support memory devices such as NAND flash and asynchronous SRAM, peripheral devices such as LCDs, and the UBM receiver for multicast or broadcast reception (QSC6270 only). In addition, EBI2 is required to support a synchronous-burst AAD NOR flash to enable a NOR/DDR SDRAM memory configuration because the simultaneous mode (NOR, SDRAM) is not supported on the EBI1 bus.

The ARM926EJ-S microprocessor is a cached processor and all its accesses to external memory use burst techniques of four or eight 32-bit words when the memory region is declared to be cacheable/bufferable. To take advantage of this QSC higher performance feature, data from memories must satisfy the requirements for these burst accesses.

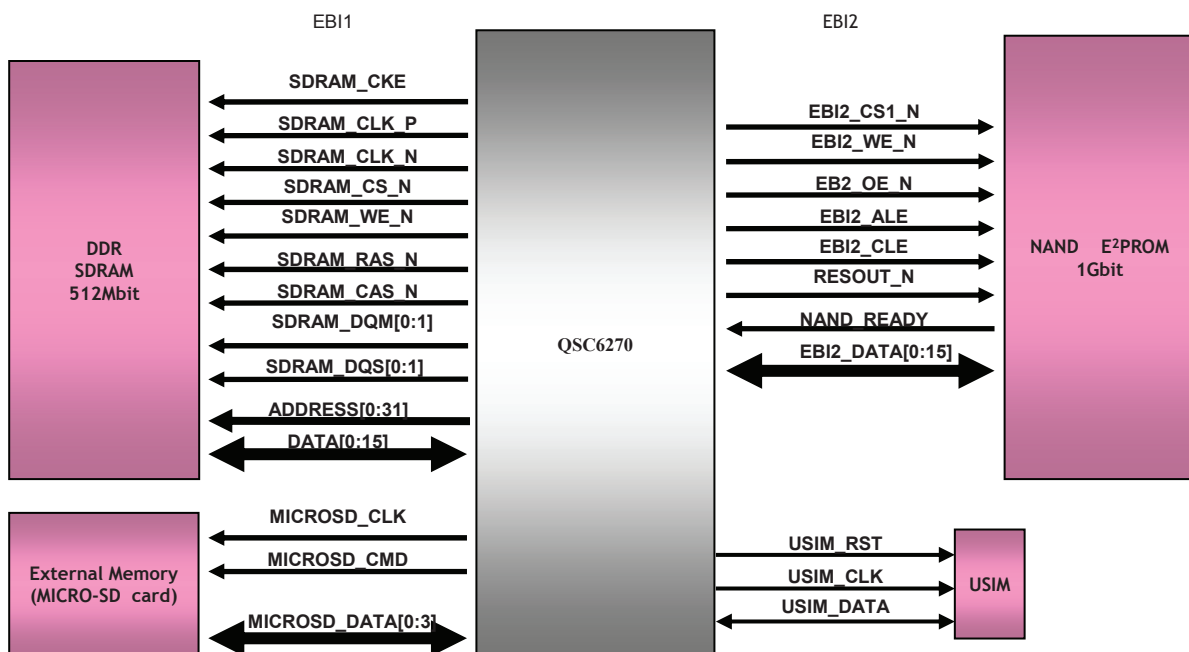


Figure 2.1.2.1 The memory control blocks of A310

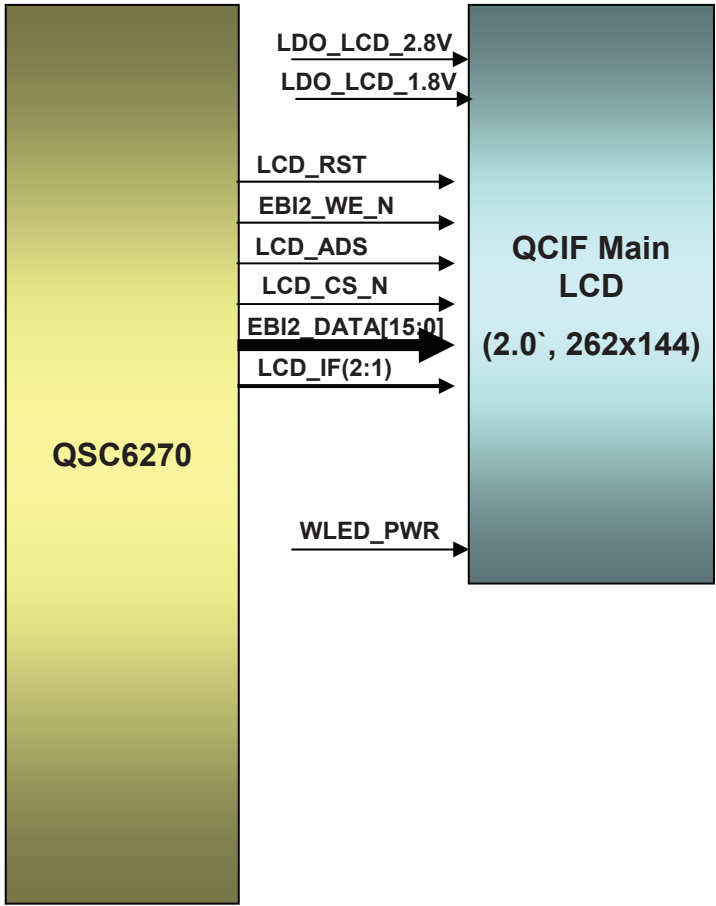


Figure 2.1.2.2 The LCD interfaces of A310

3. TECHNICAL BRIEF

3.6.3 Connectivity

QSC6270 has connectivity features as below

- USB-OTG; USB LS, FS, and HS (2.0 compliant)
- I2C compatible for peripheral controls (1.8 V)
- UART: up to 4 Mbps
- Bluetooth 2.0 support via external SoC
- WLAN via external device (SDIO)
- NFC via external module (I2C)
- FM radio via external module (I2C)
- USIM, SIM, and USB-UICC support; 1.8 and 3 V
- Keypad interface
- SPI (master only) for peripheral support
- Two secure digital controllers — WLAN and secure digital (SD) cards

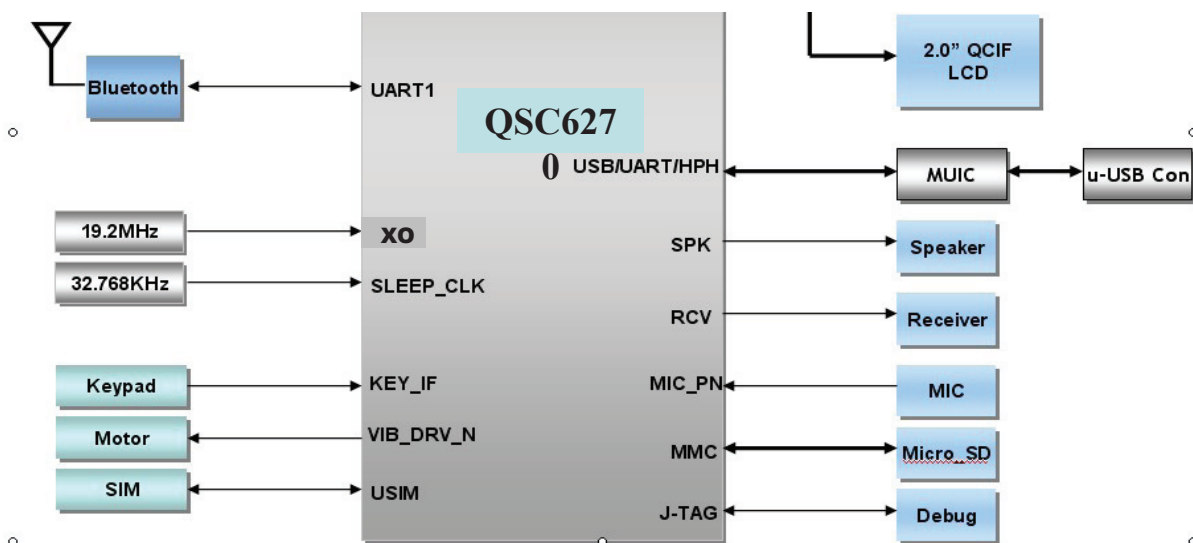


Figure 2.1.3 The connectivity of A310

3.6.4 GPIOs

QSC6270 has 78 configurable I/O pins

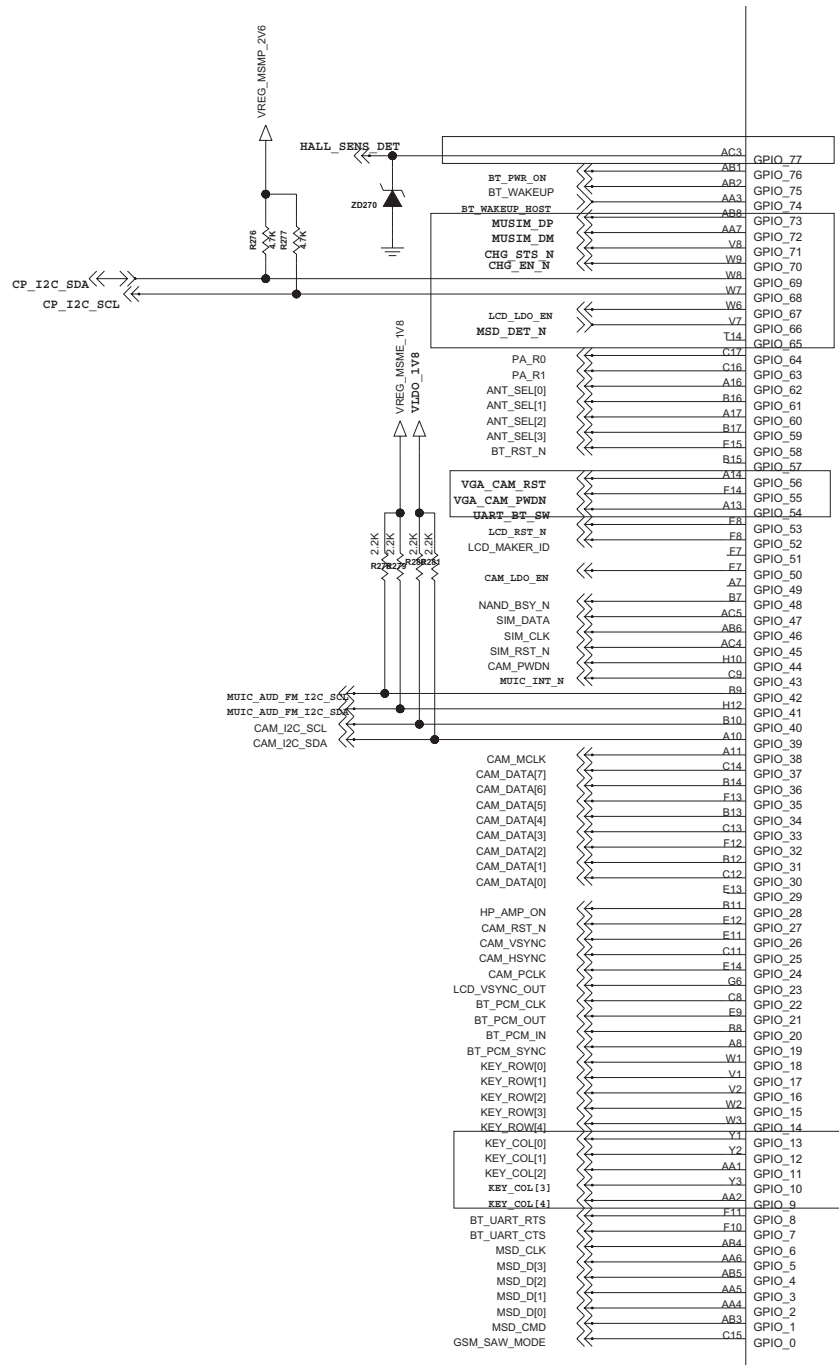


Figure 2.1.4 GPIOs of A310

3. TECHNICAL BRIEF

3.6.5 Air interfaces

The supported air-interface standards and features include: (See the RF technical description)

- ☐ UMTS/WCDMA/GSM/GPRS/EDGE Specification Release '99 (3GPP R99)
- ☐ GSM/GPRS/EDGE Specification Release 4 (3GPP R4)
- ☐ UMTS/WCDMA Specification Release 5 (3GPP R5, QSC6270 only)
- ☐ HSDPA and equalizer; 3.6 Mbps
- ☐ Enhanced GPS position location using gpsOne (with RGR6240 IC, only QSC6270)
- ☐ Integrated gpsOne functionality, featuring enhancements by SnapTrack®, Inc., to enable a wide variety of location-based services and applications, including points of interest, personal navigation, and friend finder
- ☐ Simultaneous-GPS (processes GPS using dedicated circuitry while voice and/or data signals continue to be processed separately)
- ☐ 1024x searcher, direct facility termination (DFT) accelerator, off-chip RAM for measured data storage

3.6.6 Internal base band functions

Several baseband circuits within the QSC6270 device provide functions that are necessary only to make the device operate properly — these functions are not generally used directly by other handset circuits and functions.

- ☐ PLLs and clock generation
- ☐ Modes and resets
- ☐ Security
- ☐ Qfuse
- ☐ JTAG/ETM

The clock block includes two PLLs, all phase-locked to the TCXO signal. These PLLs generate several different stable, low-jitter clock signals that are distributed throughout the QSC device and to external components as needed.

All the required WCDMA, GSM, GPS(only QSC6270), ARM, QDSP, and most peripheral clocks are derived in some way from the TCXO (or XO) source for their operating modes, plus the 32.768 kHz oscillator for their sleep modes

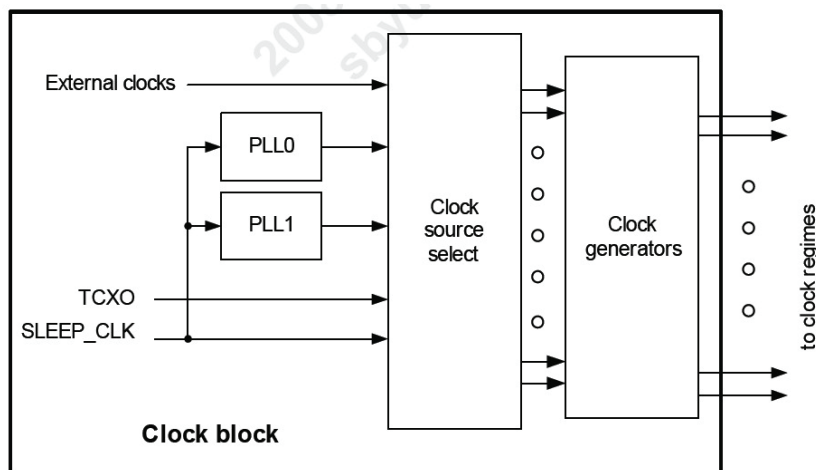


Figure 2.1.6 Clock block basic architecture of QSC6270

3. TECHNICAL BRIEF

3.6.7 Multimedia

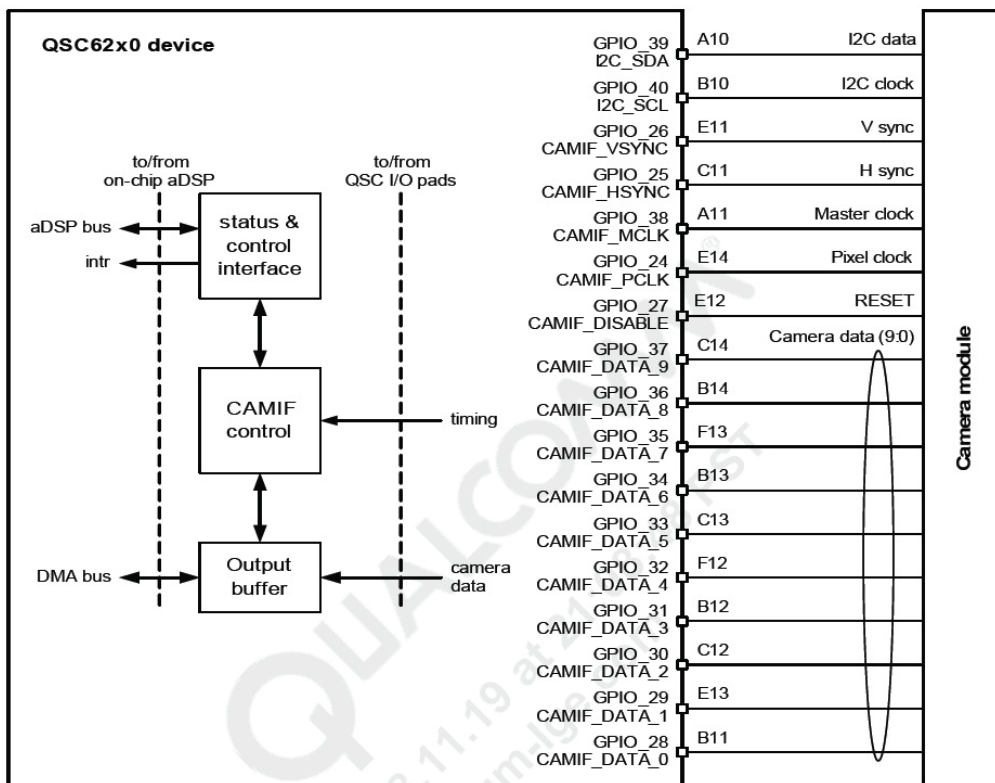
Multimedia topics are as below in QSC6270, including:

- ☐ Camera interface and video front-end
- ☐ Mobile display processor
- ☐ Additional multimedia support: video, audio, graphics, and messaging

3.6.7.1 Camera interface and video front-end

The camera interface (CAMIF) connects the QSC62x0 device directly to a camera sensor. Typical applications include Qcamera, Qcamcorder, and Qvideophone. The CAMIF delivers the raw 10-bit Bayer pattern data (preferred) to the video front-end (VFE) that performs the required image processing (RGB-triplet generation, color-space conversion, auto-white balance, auto exposure, gamma correction, etc.) and prepares the image for capture or transmission. The QSC device also supports a YUV 4:2:2 input from the sensor (8-bit, 2:1 MUX YUV or CCIR656 YUV).

The video capabilities of the two QSC devices varies slightly, with the QSC6270 providing higher performance than the QSC6270 device — greater resolution, higher capture and streaming rates, etc.



3.6.7.2 Mobile display processor

The MDP is a hardware accelerator primarily responsible for transferring an updated image from the QSC memory subsystem to the LCD module. The transferring of an updated image is an operation that is shared between software, video processing, and graphics processing, so a common block helps to reduce redundant circuitry. The MDP is designed with the assumption that the LCD panel has an embedded LCD controller and a frame buffer. The image transfer is then the copying of the image from the QSC memory system to the frame buffer within the LCD module.

While the MDP is transferring an image to the LCD module, it can perform a final set of operations to the image. The set of operations that the MDP can perform has been chosen to maximize the efficiency of the QSC memory subsystems, typically removing two or more copy operations of the image to and from memory.

The MDP reduces redundant circuitry and offloads the ARM and aDSP from memory-transfer operations and a certain set of graphics and video operations

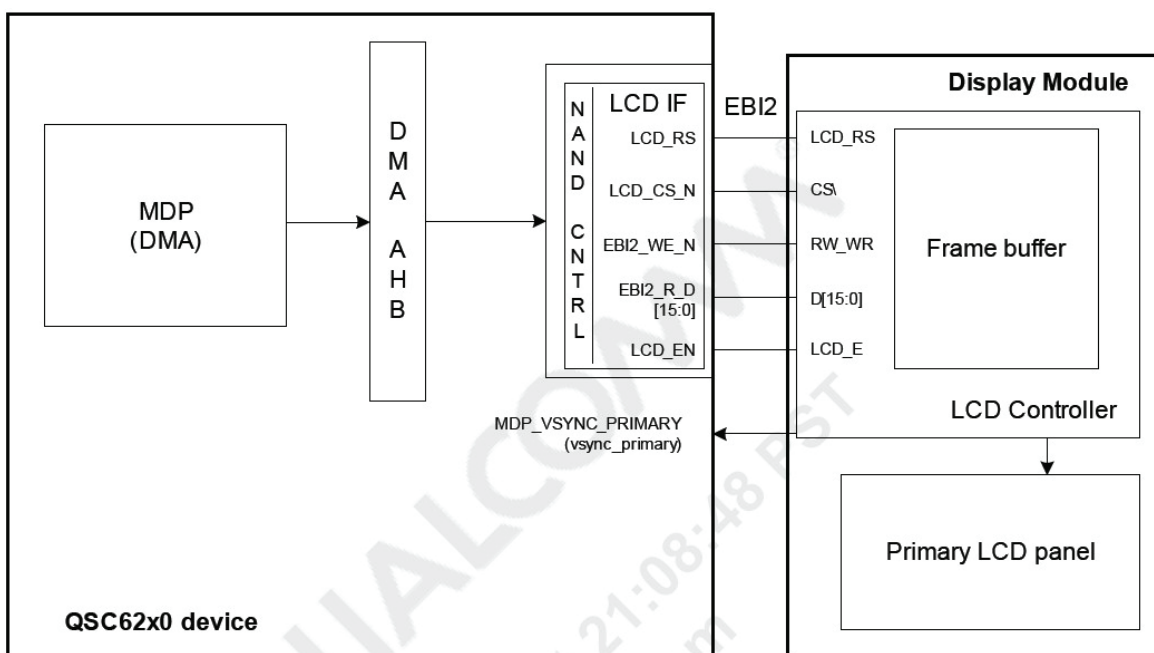


Figure 2.1.7.2.1 MDP-to-LCD interface functional block diagram

3. TECHNICAL BRIEF

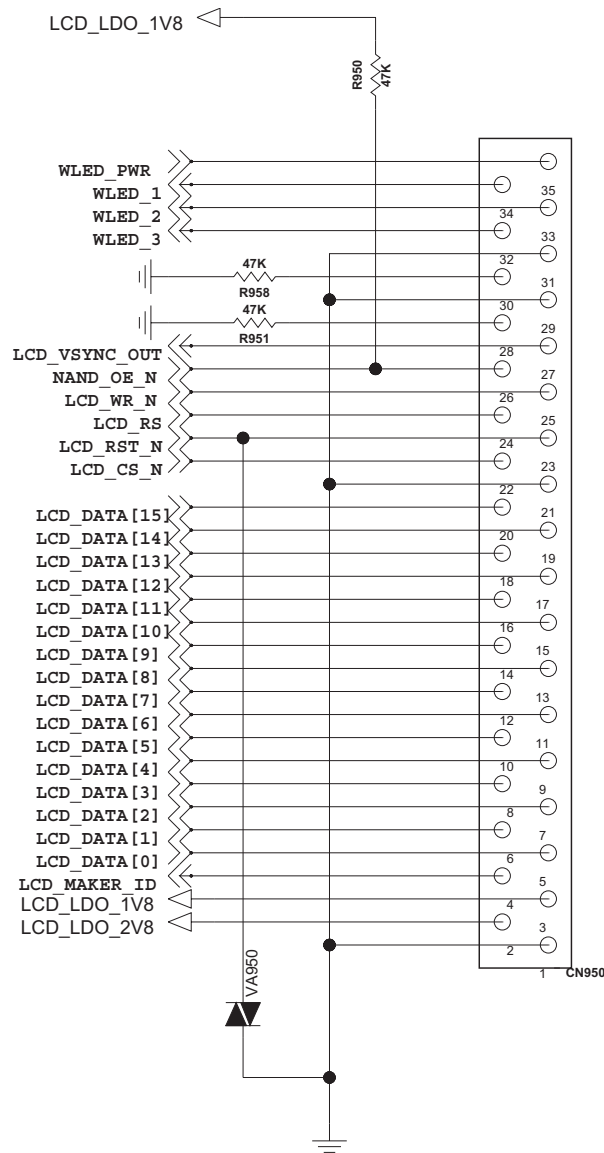


Figure 2.1.7.2.2 The LCD interface of A310

3.6.8 UART

- One universal asynchronous receiver transmitter (UART) port that supports low-speed, full-speed, and high-speed modes
- Serial data port communications that conform to the RS-232 interface protocol
- Used for data transport during Bluetooth operation (BTS402x™ SoC required)
- Other possible uses:
 - Test and debug
 - External keypad
 - Ringer
 - Load/upgrade system software
- Separate FIFOs for Rx and Tx
- Supporting circuits include:
 - Interrupt control
 - Clock source
 - Bit-rate generator (BRG)
 - Microprocessor interface
- Flow control is not available on UART2 (behind USIM)

3.6.9 USB

- Each USB link has a host and a peripheral; the host is responsible for initiating and controlling bus traffic
- The USB specification requires PCs to act as hosts, and other devices such as printers, keyboards, mice, etc., to act as peripherals
- USB 2.0 implementation defines three modes
 - Low-speed (LS): 1.5 Mbps
 - Full-speed (FS): 12 Mbps
 - High-speed (HS): 480 Mbps
- The QSC62x0 is compliant with the USB 2.0 specification
 - All three modes are supported when acting as a host
 - FS and HS are supported when acting as a peripheral
- The QSC62x0 has two USB controllers
 - Primary USB controller
 - Secondary USB controller
- The primary USB controller is supplemented by an integrated physical layer (PHY)

3.6.10 HKADC

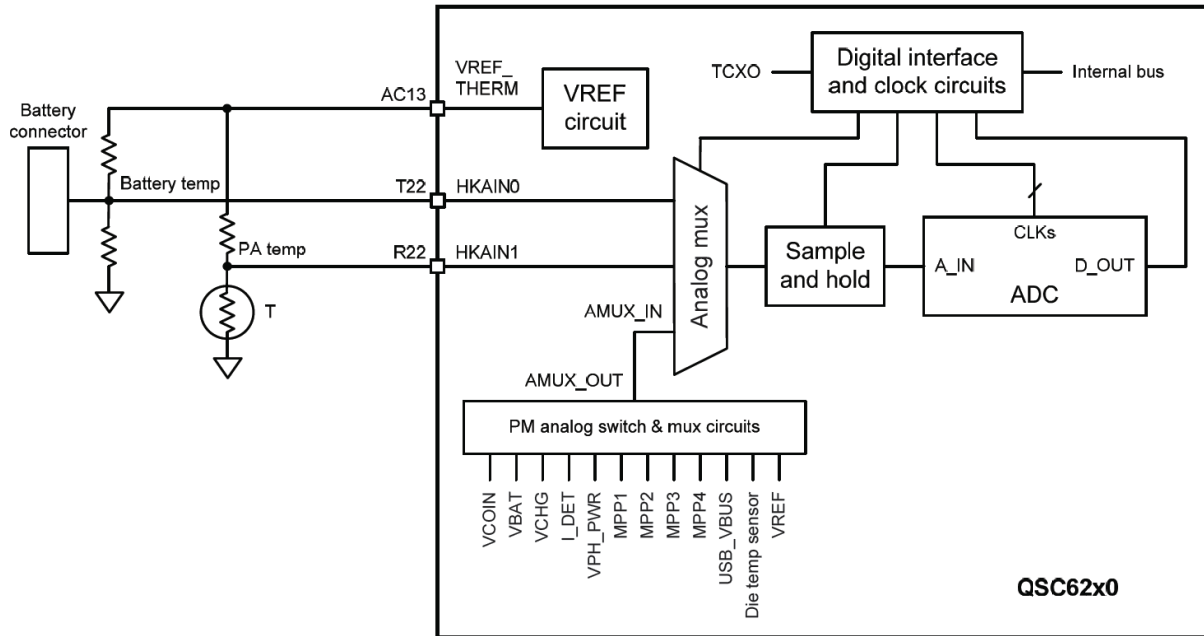
The HKADC includes an analog multiplexer that selects an input for the sample and hold circuit. One of three inputs can be selected:

HKAIN1, pin R22 – an external connection that is available as a general-purpose input, though it is often used to monitor the power amplifier(s) temperature.

An on-chip connection to the power management circuit's analog multiplexer output. This allows monitoring of:

- Key power supply nodes such as VBAT, VCHG, etc.
- Multipurpose pins (when configured as analog inputs)
- A few on-chip parameters such as the die temperature or VREF

3. TECHNICAL BRIEF



QSC6270HKADC Block diagram

3.7 Power management

3.7.1 Input power management

- ☐ Valid external supply attachment and removal detection
- ☐ Unregulated (closed-loop) external charger supply as input power source
- ☐ Integrated PFET charging pass transistor; eliminated sense resistor
- ☐ Support for lithium-ion and lithium-ion polymer main batteries; nickel-based batteries are not supported
- ☐ Trickle, constant current, constant voltage, and pulse charging of the main battery
- ☐ Autonomous charging option – driven by an on-chip state machine without software intervention
- ☐ Software-controlled charging option – backwards-compatible with previous QSC and PM products
- ☐ Coin-cell battery (including charging)
- ☐ Battery-voltage detectors with programmable thresholds
- ☐ VDD collapse protection
- ☐ Charger-current regulation and real-time monitoring for overcurrent protection
- ☐ Charger-transistor protection by thermal control
- ☐ Control drivers for the internal charging PFET and external battery PFET
- ☐ Voltage, current, and thermal control loops
- ☐ Automated recovery from sudden momentary power loss (requires external 32.768 kHz crystal)

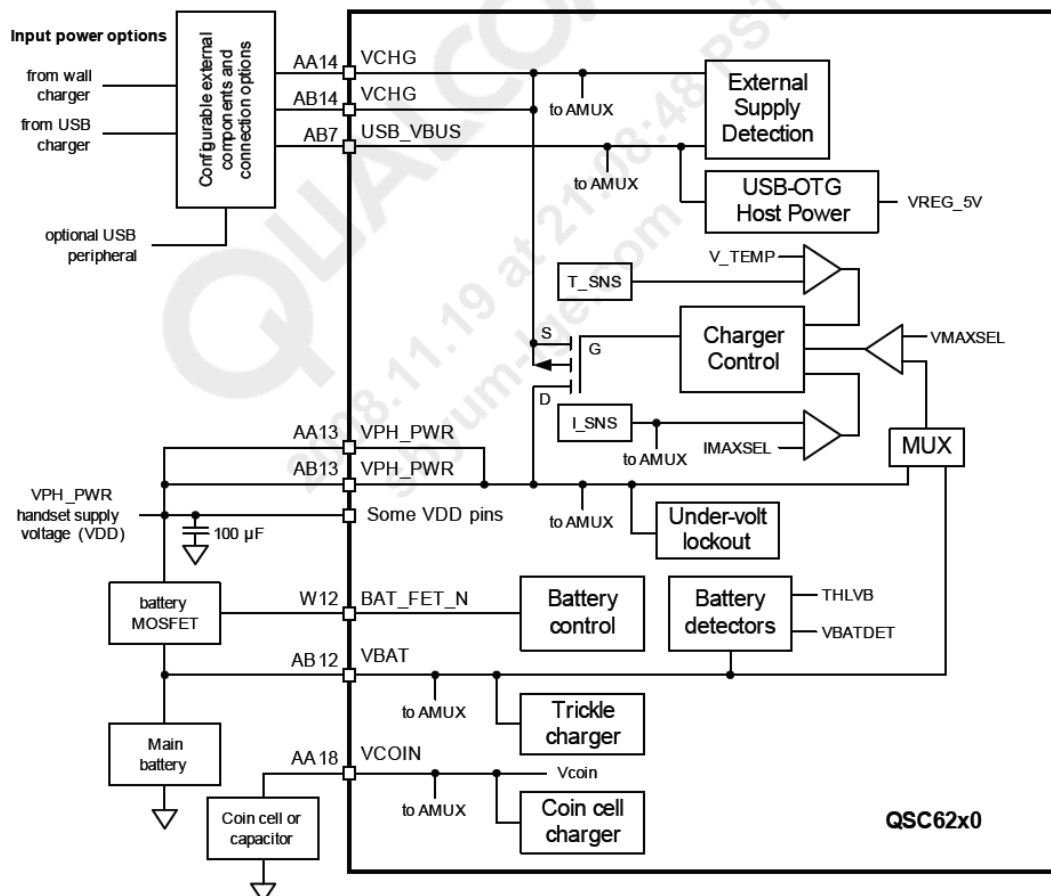


Figure 2.2.1 Input circuits schematic diagram

3. TECHNICAL BRIEF

3.7.2 Output voltage regulation

The QSC62x0 device includes all the regulated voltages needed for most low-cost wireless handset applications (and many other applications). Independent regulated power sources are required for various electronic functions to avoid signal corruption between diverse circuits, support power-management sequencing, and meet different voltage-level requirements. Sixteen voltage regulators are provided — all programmable, all derived from a common bandgap reference circuit.

Three major types of voltage regulator circuits are on-chip:

- ☐ Three positive voltage switched-mode power supply (SMPS) circuits
 - One boost converter (rated for 600 mA)
 - Three buck converters (rated for 500 mA each)
- ☐ Thirteen positive voltage linear regulators
 - Four rated for 300 mA
 - Six rated for 150 mA
 - Three rated for 50 mA
- ☐ One negative voltage charge pump rated for 200 mA, referred to as a negative charge pump(NCP)

Each regulator has two logic-OR input bits; a logic high at either input enables that regulator:

- ☐ A master bit that enables all regulators according to their default condition
- ☐ A dedicated bit that enables only that regulator

The master enable reduces the number of write cycles needed when switching between the phone's sleep and active modes.

Additional comments that apply to regulator functions:

- ☐ If a regulator's default condition is on, that regulator will power on automatically at QSC startup.
- ☐ The MSMP regulator must be on to allow internal communications between major functional blocks.
- ☐ Each regulator and SMPS can provide more than its rated output current, though some performance characteristics might be degraded.
- ☐ All regulated output voltages are programmable.
- ☐ All regulators can be set to a low-power mode except the VREG_USB_3P3 and VREG_NCP circuits

Type/name ^{1 2}	Default conditions ⁴	Voltage range	Intended use
SMPS - boost (600 mA)	Off, 5.000 V	3.000 to 6.100 V	USB-OTG, camera flash, high-power audio
SMPS - buck MSMC (500 mA)	On, 1.225 V	0.750 to 3.050 V	Processor core
RF1 (500 mA)	On, 2.300 V	0.750 to 3.050 V	First stage regulator for subregulation set 1
RF2 (500 mA)	On, 1.400 V	0.750 to 3.050 V	First stage regulator for subregulation set 2
Linear - 300 mA MSME	On, 1.800 V	1.500 to 3.050 V	EBI circuits and external memory, pads
MSMP ³	On, 2.600 V	1.500 to 3.050 V	Pad voltage for digital I/Os
RFA	Off, 2.200 V	1.500 to 3.050 V	RF and analog circuits
GP2	Off, 2.900 V	1.500 to 3.050 V	External WLAN circuits
Linear - 150 mA RFRX2	Off, 1.300 V	0.750 to 1.525 V	RF receiver circuits
RFTX2	Off, 1.300 V	0.750 to 1.525 V	RF transmitter circuits
CDC2	Off, 1.300 V	0.750 to 1.525 V	Audio codec circuits
MPLL	On, 1.300 V	0.750 to 1.525 V	Digital PLL circuits
USIM	Off, 1.800 V	1.500 to 3.050 V	USIM circuits and interface
GP1	Off, 2.850 V	1.500 to 3.050 V	External Bluetooth circuits
Linear - 50 mA TCXO	On, 2.850 V	1.500 to 3.050 V	TCXO and XO circuits
USB_2P6	Off, 2.600 V	1.500 to 3.050 V	USB circuits and interface at 2.6 V
USB_3P3	Off, 3.300 V	3.000 to 6.100 V	USB circuits and interface at 3.3 V
SMPS - NCP (200 mA)	Off, -1.800 V	N/A	Headphone negative voltage supply

Table 2.2.2 Voltage regulator summary

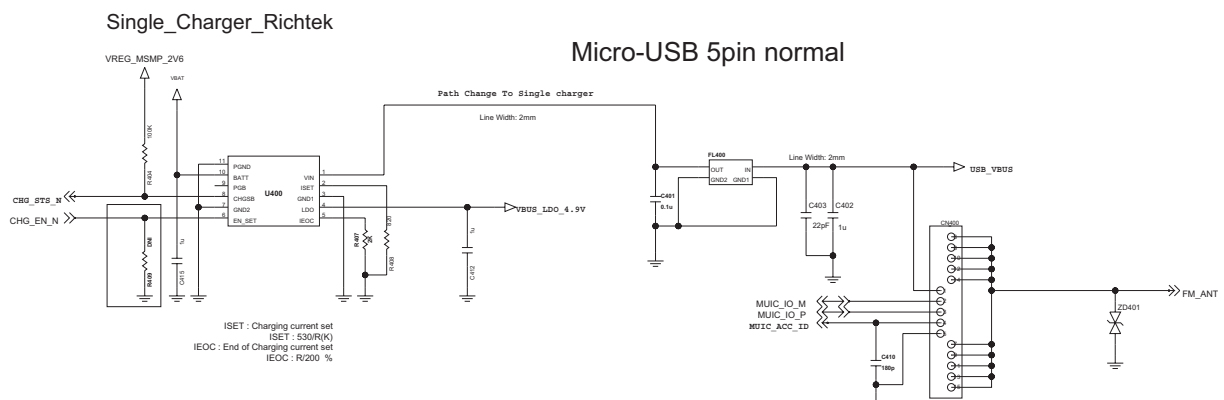
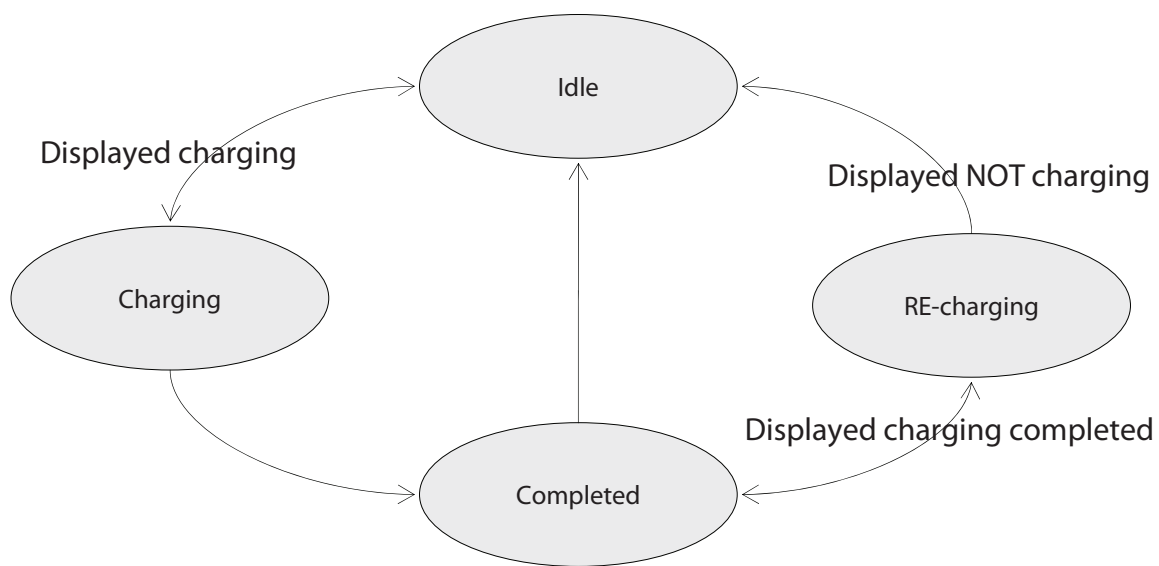
1. All regulator names are based on their intended use, though some may be used to power alternate functions. for example, the USIM regulator is intended to power an external SIM card but may be used to power other circuits (or not used at all).
2. Each current listed in this table is its regulator's rated value – the current at which the regulator meets all its performance specifications. Higher currents are allowed, but higher input voltages may be required and some performance characteristics may become degraded. See the appropriate regulator sections for details.
3. VREG_MSMP powers key internal circuits and should be kept on at its default voltage setting.
4. All regulators have default output voltage settings, even if they default to an off condition.

3. TECHNICAL BRIEF

3.7.3 Charging control

A310 use single Charger.

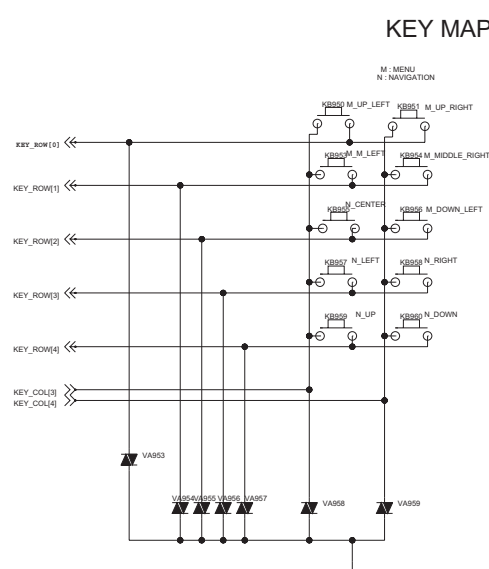
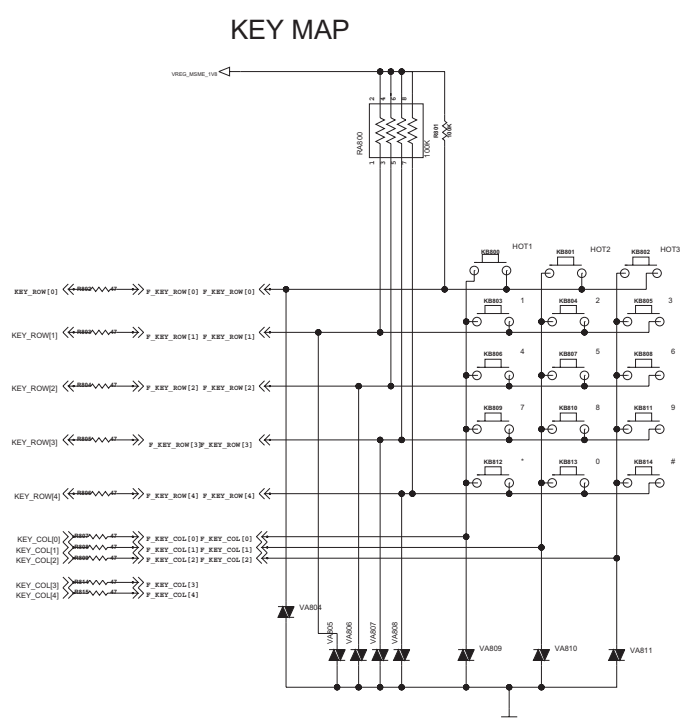
- Single charger has five mode like " OFF / TRICKLE / ISET / USB500 / FACTORY mode".
- Single Charger is working as ISET mode in case of CC(Constant Current), CV(Constant Voltage) mode, as USB 500mode in case of USB Charging.
- FACTORY mode is working only for Factory use.



3.8 SUB SYSTEM

3.8.1 KEY PAD

QSC62x0 devices provide a keypad interface that supports five sense lines, or columns, and (typically) five keypad rows (though more can be software defined). The columns are a set of five QSC pins that are used for sensing (KEYSENSE_xN); another set of pins are connected to the keypad's rows and are used for driving (KYPD_x). The sensed columns reveal when any keypad button is pressed, and then the rows are driven sequentially to determine precisely which keypad button was pressed.



3. TECHNICAL BRIEF

3.8.2 External memory interface

The QSC62x0 device has two external bus interface (EBI) ports: EBI1 and EBI2.

EBI1 supports high-speed synchronous dynamic devices. Its memory controller supports the new mobile DDR SDRAM memories with its higher bandwidth and ability to run at high clock frequencies. This interface supports the high-bandwidth, high-density, and low-latency requirements of the QSC's advanced on-chip capabilities such as the ARM9 processor, highperformance graphics, and video applications.

EBI2 is the slower speed interface intended to support memory devices such as NAND flash and asynchronous SRAM, peripheral devices such as LCDs, and the UBM receiver for multicast or broadcast reception (QSC6270 only). In addition, EBI2 is required to support a synchronous-burst AAD NOR flash to enable a NOR/DDR SDRAM memory configuration because the simultaneous mode (NOR, SDRAM) is not supported on the EBI1 bus.

EBI1 Features

EBI1 is a high-performance external memory interface for the QSC62x0 digital block that supports DDR SDRAM devices

Specifically, the following memory devices are supported on EBI1:

■ SDRAM

- 16-bit low-power DDR SDRAM
- Minimum size per chip-select: 16 MB (128 Mbit)
- Maximum size per chip-select: 128 MB (1 Gbit, 1 k columns only)
- Characteristics of the EBI1 clock are listed below:
- Maximum clock rate is 92 MHz, defined by the AMSS software.
- The EBI1 memory controller clock is synchronous to the bus clock (HCLK).

EBI2 Features

EBI2 is used to interface with slower memory and peripheral devices (NAND flash, burst NOR, LCDs, etc.). The following EBI2 devices are supported:

■ NAND flash

- 8/16 bit, single-level cell (SLC)/multi-level cell (MLC) 512/2048-byte page devices
- DMA support
- Boot-up capability from the above devices

■ Burst NOR flash

- 16-bit multiplexed AAD burst NOR devices

■ 8/16/18-bit (write only) LCD devices (both Motorola and Intel style)

Characteristics of the EBI2 clock are listed below:

- The maximum clock rate is 46 MHz, defined by the AMSS software.
- The EBI2 memory controller operates at HCLK/2.
- Broadcasting and multicasting (QSC6270 only, with MBP1600 IC) are based on:
 - Wideband MediaFLO™, DBV-H, and ISDB-T

Asynchronous/burst controller (EBI1 and EBI2)

The external memory controller (xmem_ctlr) forms the asynchronous/burst controller for both EBI1 and EBI2 in the QSC62x0 device. The controller is generic in terms of its software programmable options and can be customized when used for EBI1 and EBI2. This block has been enhanced in the QSC62x0 device to support 32-bit burst memories and byte masking during write operations.

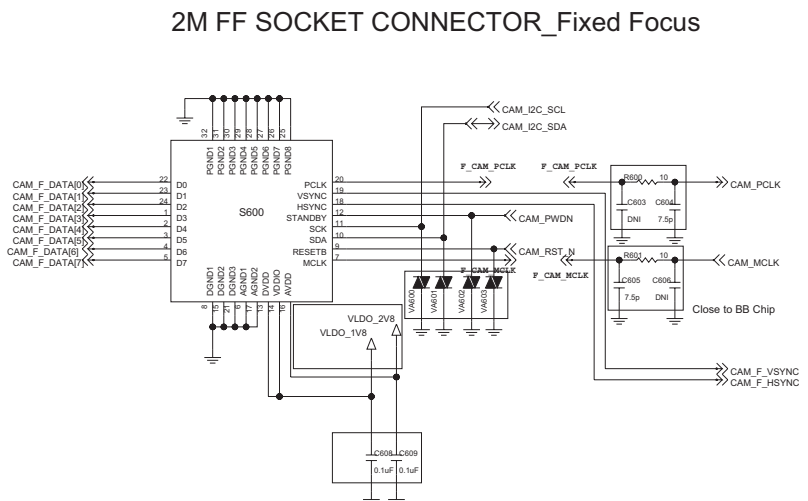
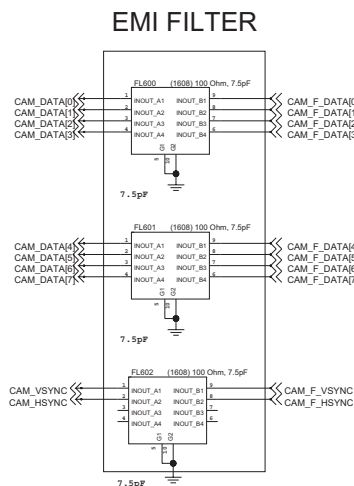
3.8.3 Camera Interface (2M CAMERA)

3.8.3.1 2M CAMERA

A310 Installed a 2M Pixel Camera. Below picture shows the camera board to board connector and camera I/F signal.

Camera Module Connector Pin Description

No	Symbol	Description	No	Symbol	Description
1	D3	8Bit Data[3]	13	DVDD	Core Power
2	D4	8Bit Data[4]	14	IOVDD	I/O Power
3	D5	8Bit Data[5]	15	DGND	Digital Ground
4	D6	8Bit Data[6]	16	AVDD	Analog Power
5	D7	8Bit Data[7]	17	AGND	Analog Ground
6	AGND	Analog Ground	18	HSYNC	Horizontal Sync
7	MCLK	Master Input CLK	19	VSYNC	Vertical Sync
8	DGND	Digital Ground	20	PCLK	Pixel CLK
9	RESETB	Reset (Negative)	21	DGND	Digital Ground
10	SDA	I ² C Data	22	D0	8Bit Data[0]
11	SCL	I ² C CLK	23	D1	8Bit Data[1]
12	STANDBY	Standby	24	D2	8Bit Data[2]



3. TECHNICAL BRIEF

3.8.4 LCD Module (LQ024Q3UX01 : SHARP)

This main LCD has a 2.0 inch diagonally measured active display area with 176(RGB)X220 resolution. Each pixel is divided into Red, Green and Blue sub-pixels and dots which are arranged in vertical stripes.

Main LCD color is determined with 262k colors signal for each pixel.

The IM200CBNWA has been designed to apply the interface method that enables low power, high speed, and high contrast. The IM200CBNWA is intended to support applications where thin thickness and low power are critical factors and graphic displays are important

GENERAL DESCRIPTION

Item	Main Display	Remark
Display Mode	Normally White, Transmissive LCD	
User Viewing Direction	6 O' Clock	
Driving Method	A-Si TFT Active Matrix	
Input Signals	8/9/16Bit, CPU I/F Parallel	
Outside Dimensions	38.5mm(H) x 51.8mm(V) x 3.2mm(D)(Typ.)	
Active Area	31.68mm(H) x 39.60mm(V)	
Number of Pixels	176×RGB×220 Pixels	
Pixel Pitch	0.18mm(H) X 0.18mm(V)	Note 1)
Pixel Arrangement	RGB Vertical stripes	Note 1)
Drive IC	LGDP4525B	
Weight	7.8g±10%	
Inversion Type	1 Line Inversion	Note 2)

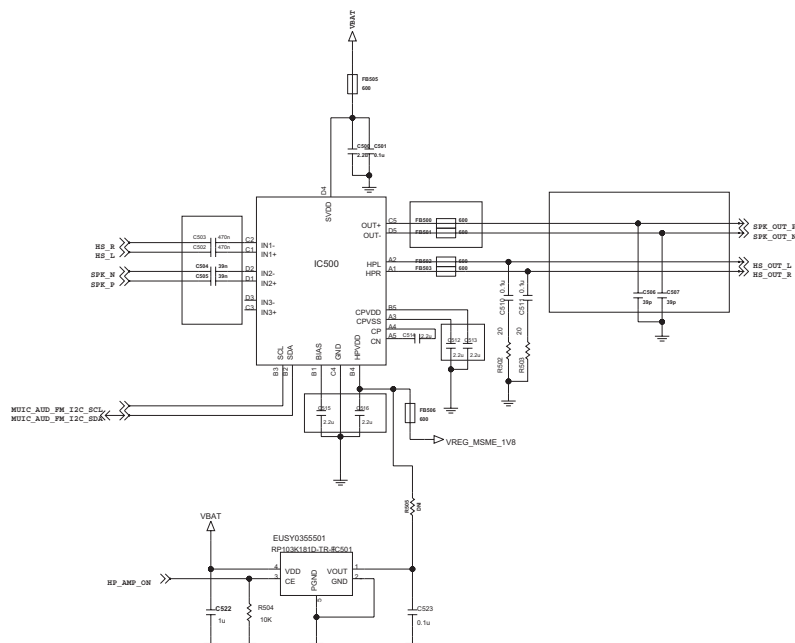
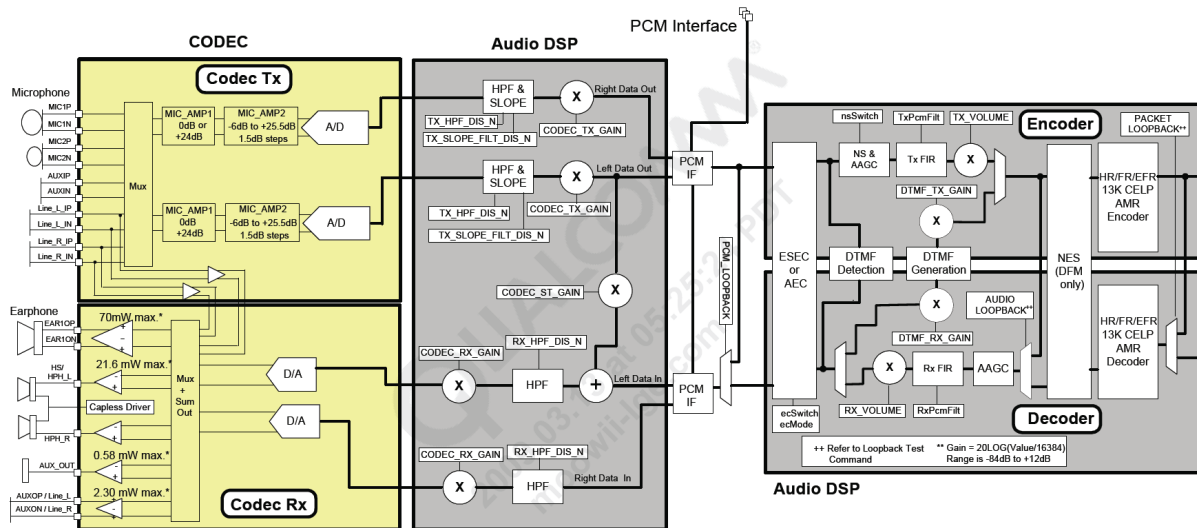
Input Signal and Power : Pin Description (Input Pin : 35Pin Conn)

Pin No.	Symbol	Description	Remark
1	GND	-	Ground
2	VCC1(2.6~3.3)	I	Power Supply for internal logic regulator circuits
3	VCC2(I/O)(1.65~3.3)	I	Power Supply for internal logic regulator circuits
4	MAKER_ID(High)	I/O	HIGH (VCC2)
5	D0	I/O	Bi-Directional Data Bus
6	D1	I/O	Bi-Directional Data Bus
7	D2	I/O	Bi-Directional Data Bus
8	D3	I/O	Bi-Directional Data Bus
9	D4	I/O	Bi-Directional Data Bus
10	D5	I/O	Bi-Directional Data Bus
11	D6	I/O	Bi-Directional Data Bus
12	D7	I/O	Bi-Directional Data Bus
13	D8	I/O	Bi-Directional Data Bus
14	D9	I/O	Bi-Directional Data Bus
15	D10	I/O	Bi-Directional Data Bus
16	D11	I/O	Bi-Directional Data Bus
17	D12	I/O	Bi-Directional Data Bus
18	D13	I/O	Bi-Directional Data Bus
19	D14	I/O	Bi-Directional Data Bus
20	D15	I/O	Bi-Directional Data Bus
21	GND	I/O	Bi-Directional Data Bus
22	/CS	I	Chip Select for LCD
23	/RESET	I	Reset Pin. Initialize the LSI at the low level
24	RS	I	Register Select
25	/WR	I	Write Data
26	/RD	I	Read-Strobe Signal Active low
27	VSYNC_OUT	-	FLM
28	IFMODE_1(IM0)	I	Mode select Pin
29	GND	-	Ground
30	IFMODE_2(IM3)	I	Mode select Pin
31	LED_Cathod4(GND)	I	LED3 Cathode Connection
32	LED_Cathod3	I	LED3 Cathode Connection
33	LED_Cathod2	I	LED2 Cathode Connection
34	LED_Cathod1	I	LED1 Cathode Connection
35	LED_Anode	-	Power Supply for LED(B/L)

3. TECHNICAL BRIEF

2.8.5 Audio Signal Processing & Interface

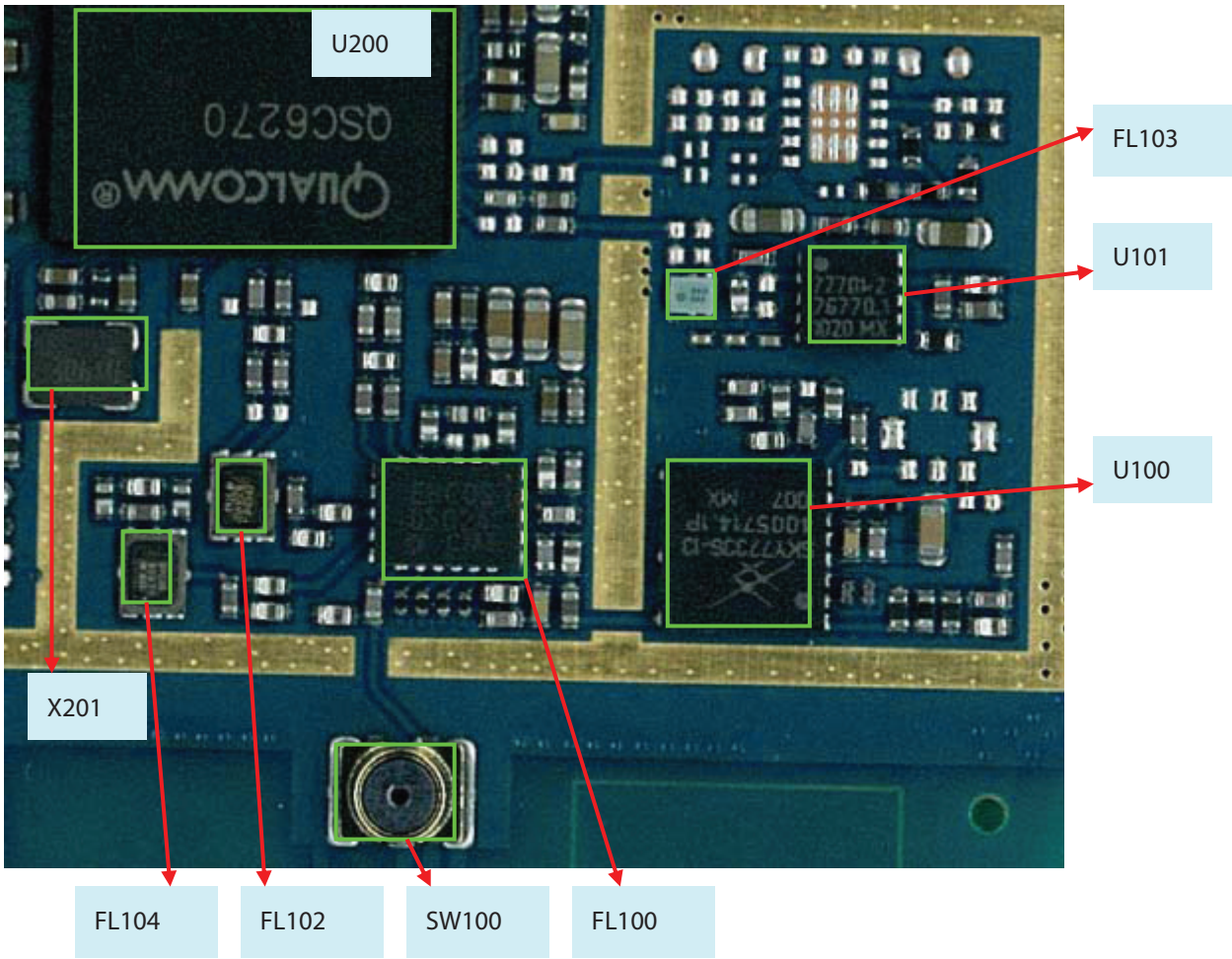
Audio signal processing is divided uplink path and downlink path. The uplink path amplifies the audio signal from MIC and converts this analog signal to digital signal and then transmits it to DBB Chip (MSM6280). This transmitted signal is reformed to fit in GSM & WCDMA frame format and delivered to RF Chipset. The downlink path amplifies the signal from DBB chip (MSM6280) and outputs it to receiver (or speaker). The receive path can be directed to either one of two earphone amplifiers or the auxiliary output. The outputs earphone1 (EAR1OP, EAR1ON) and auxiliary out (LINE_OP, LINE_ON) are differential outputs. Earphone2 (HPH_L, HPH_R) is a single-ended output stage designed to drive a headset speaker. The microphone interface consists of two differential microphone inputs, one differential auxiliary input and a two-stage audio amplifier.



4. TROUBLE SHOOTING

4.1 RF Component

MAIN board Bottom



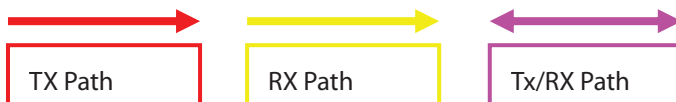
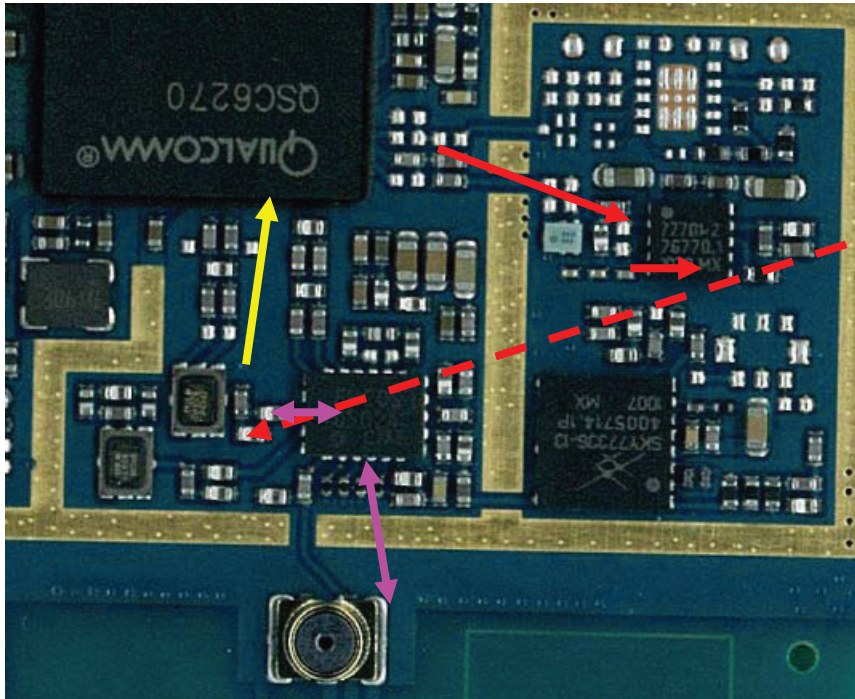
RF component (WCDMA / GSM)

Reference	Description	Reference	Description
U200	QSC6270	FL102	WCDMA I Duplexer
X201	XO	FL104	WCDMA VIII Duplexer
FL103	WCDMA I TX SAW Filter	FL100	FEM
U101	WCDMA I TX PAM	SW100	RF connector
U100	GSM(EDGE) TX PAM		

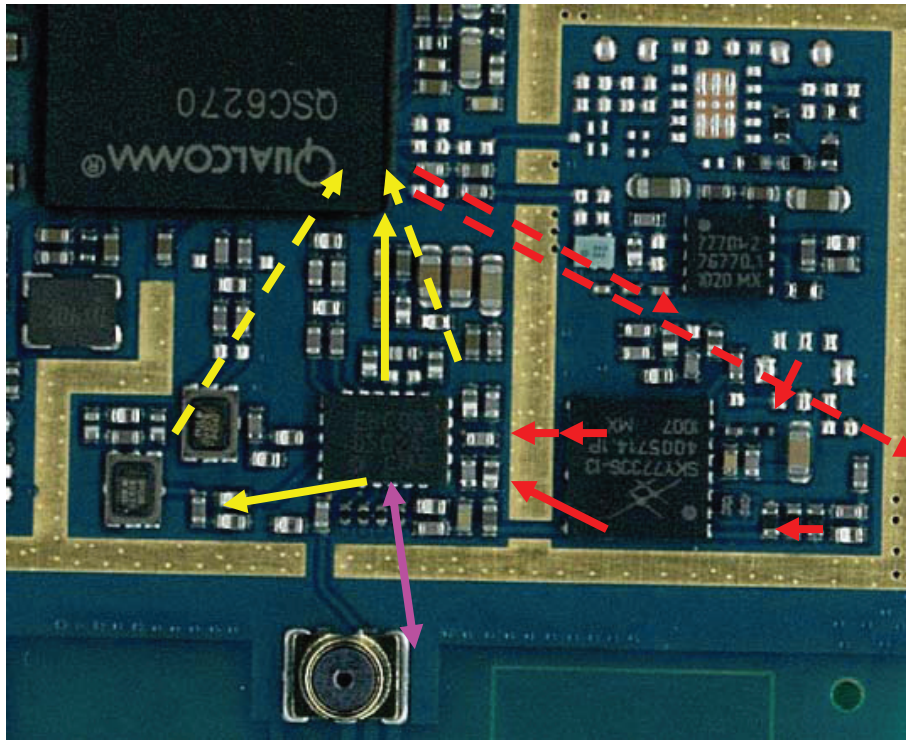
4. TROUBLE SHOOTING

4.2 RF Path

4.2.1 WCDMA path

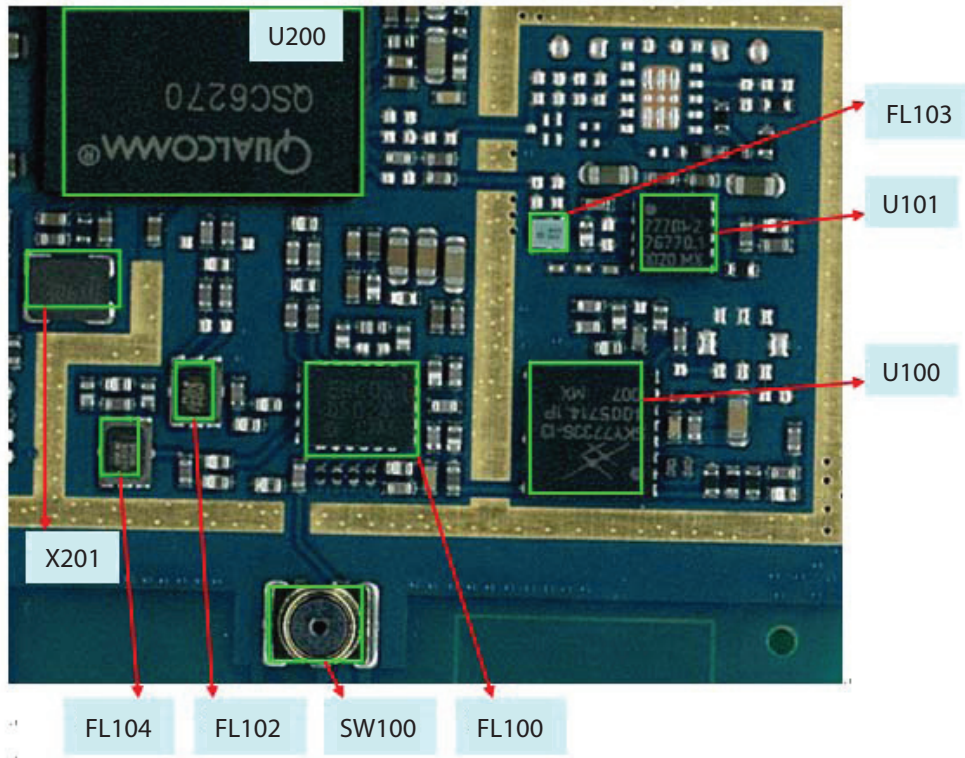


3.2.2 GSM path

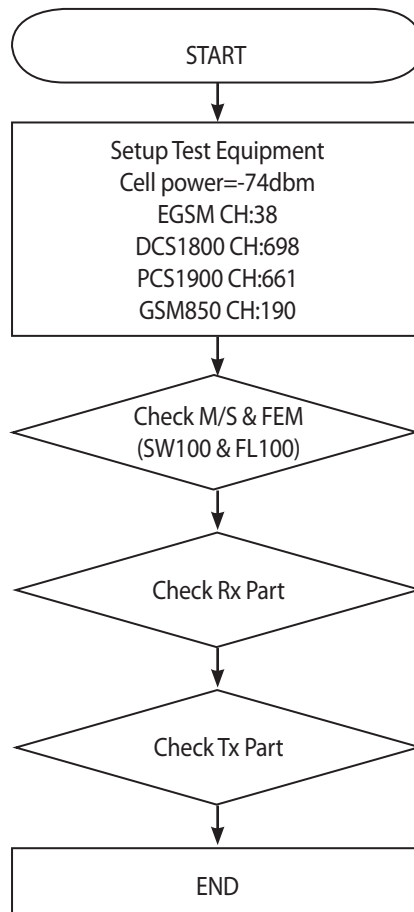
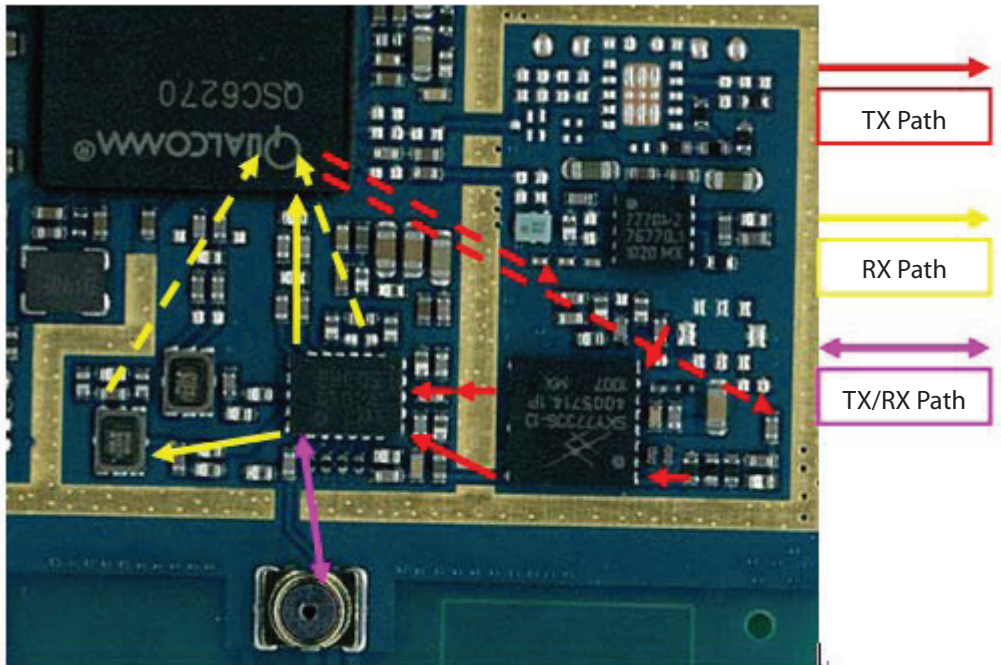


4. TROUBLE SHOOTING

4.3 Trouble Shooting of GSM Part (GSM850/GSM900/1800/1900)

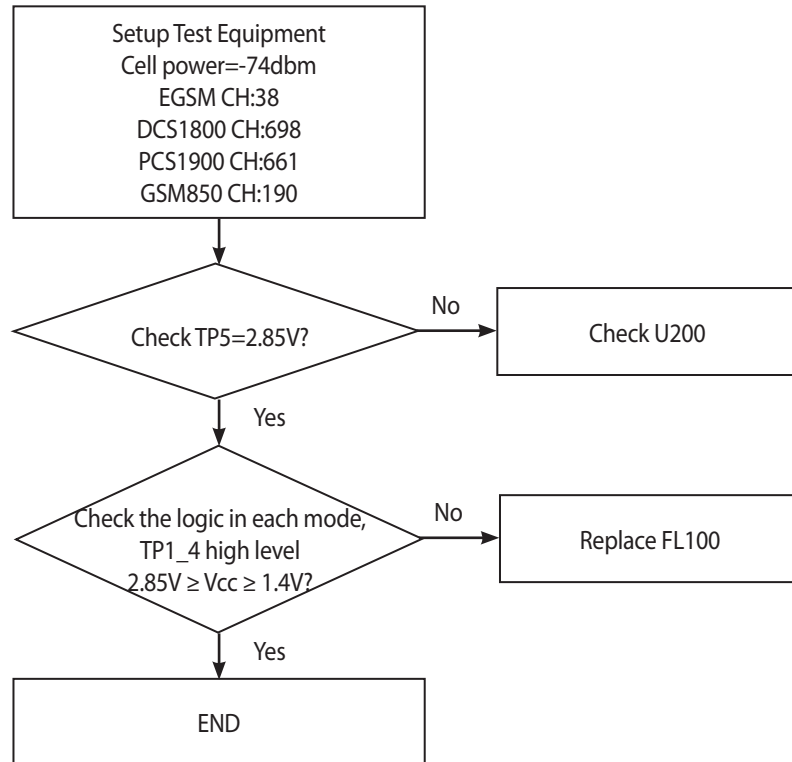


4. TROUBLE SHOOTING



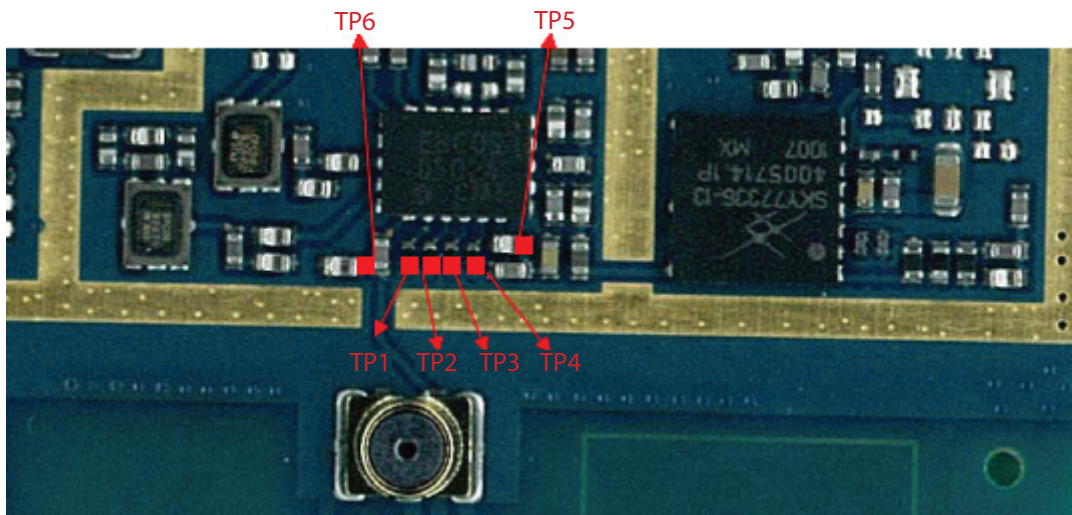
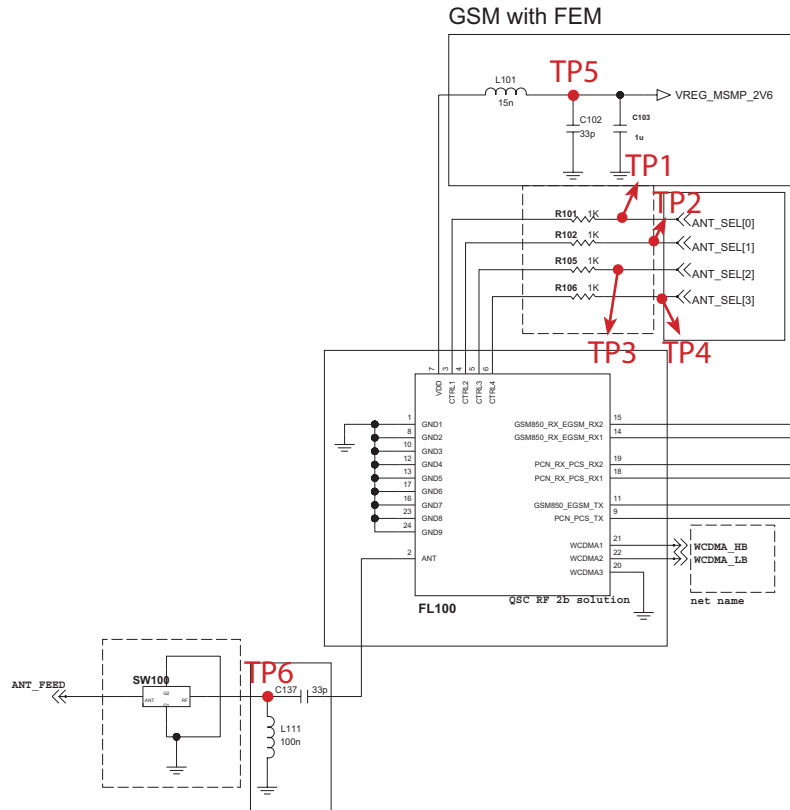
4. TROUBLE SHOOTING

4.3.1 Checking Front-End Module Block



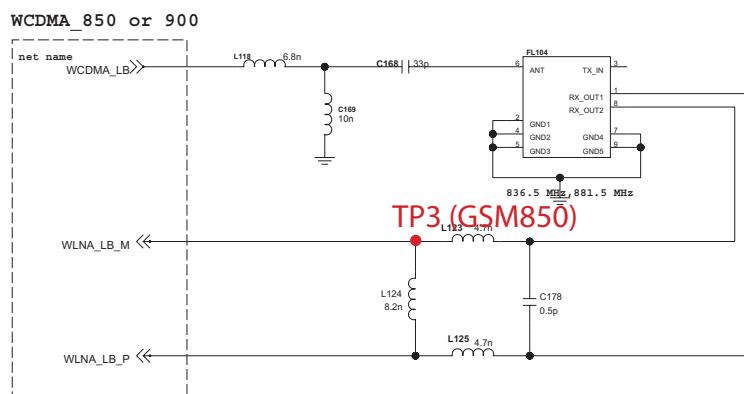
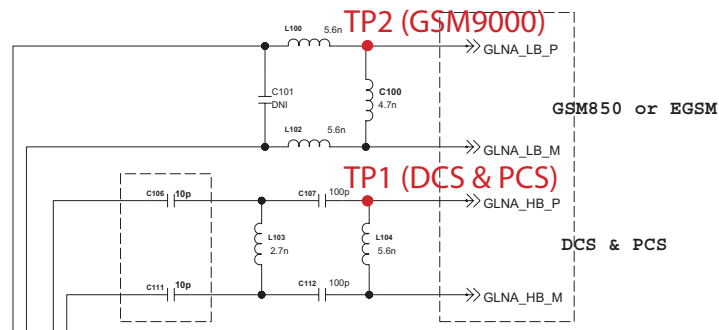
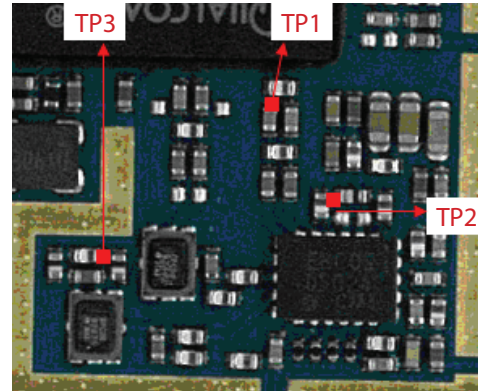
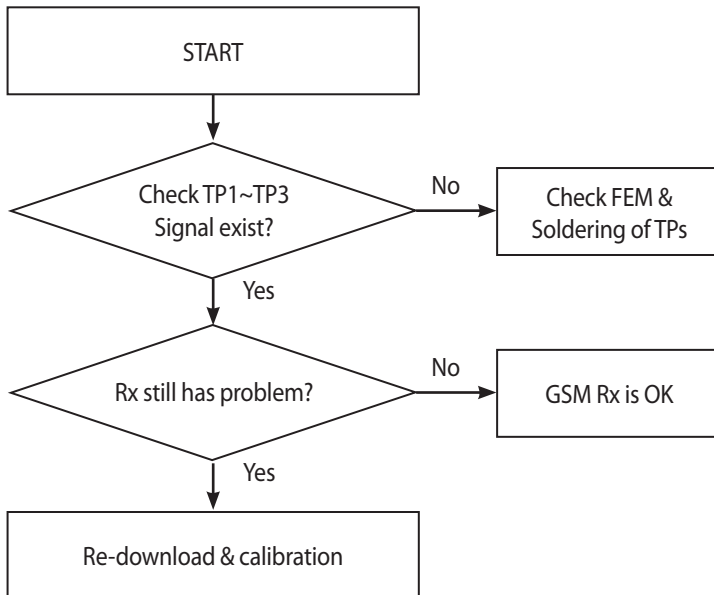
	ANT_SEL0	ANT_SEL1	ANT_SEL2	ANT_SEL3
GSM850/EGSM TX	1	1	0	0
PCN/PCS TX	1	0	0	0
Pin 22 (W_850)	0	0	0	1
Pin 20	0	0	1	1
Pin 21 (W2100)	0	1	0	1
GSM850 RX	0	0	0	1
EGSM RX	0	1	1	0
PCN RX	0	0	0	0
PCS RX	0	1	0	0

4. TROUBLE SHOOTING

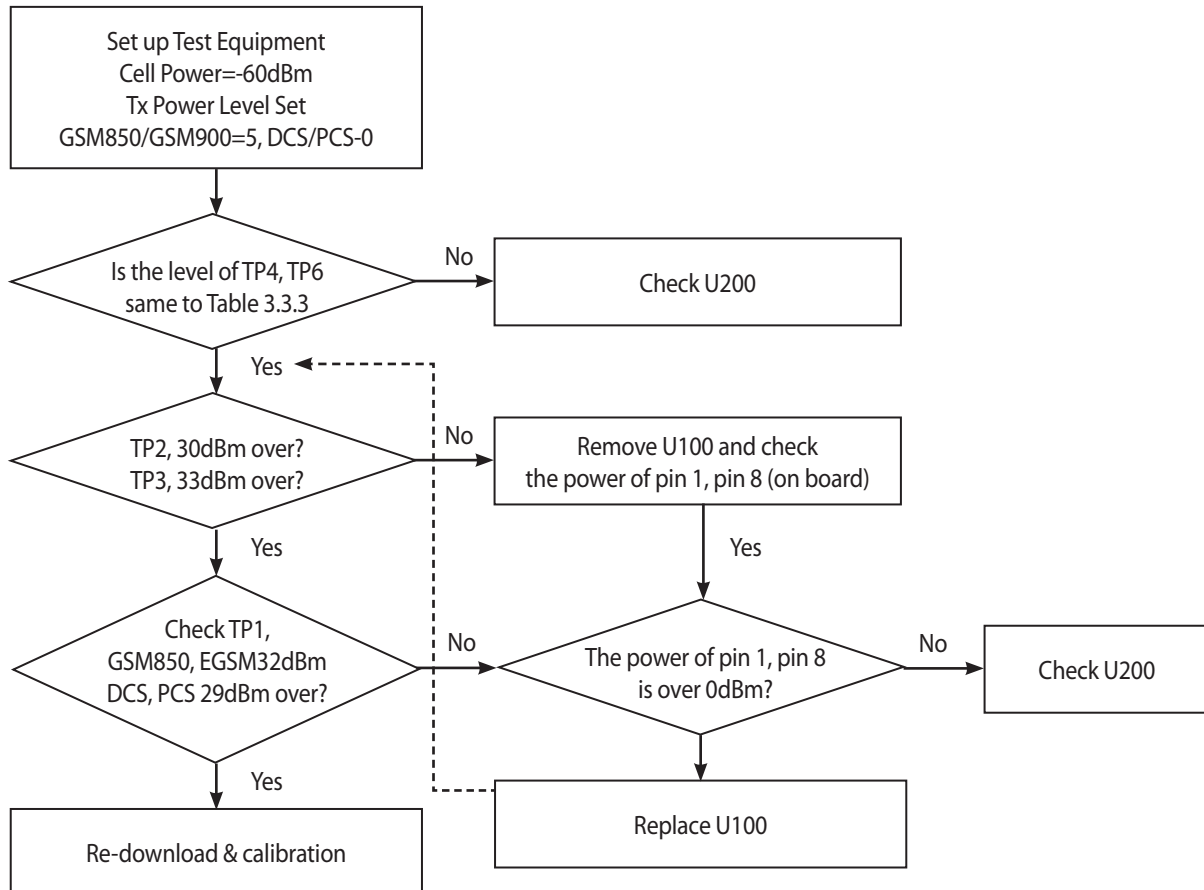


4. TROUBLE SHOOTING

4.3.2 Checking GSM Rx part



4.3.3 Checking GSM Tx part

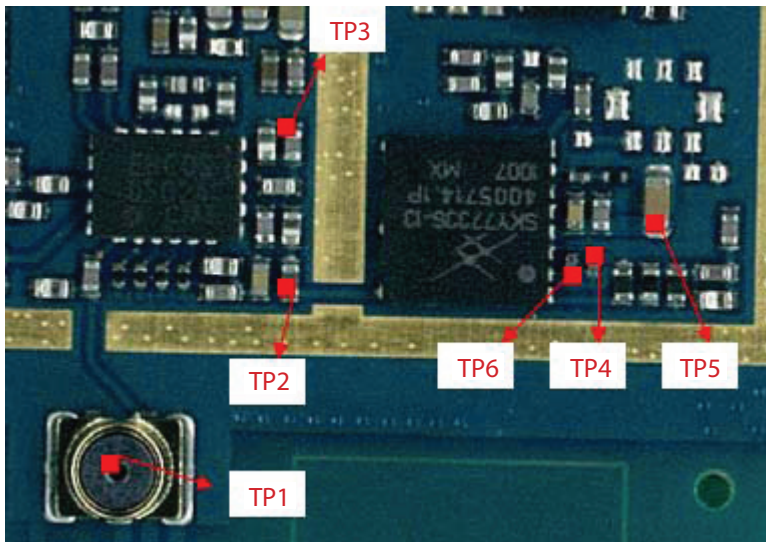
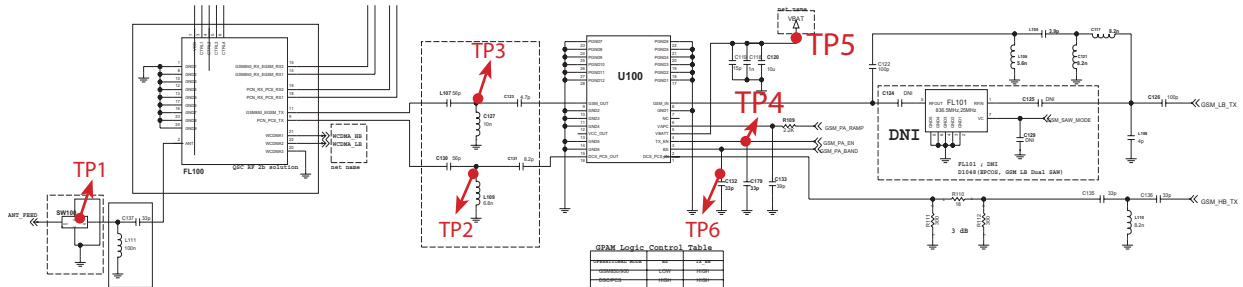


GPAM Logic Control Table

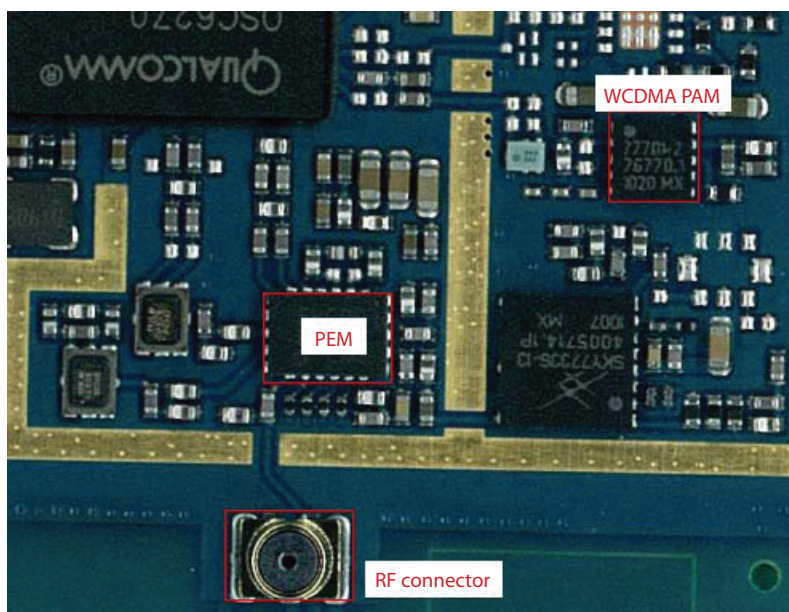
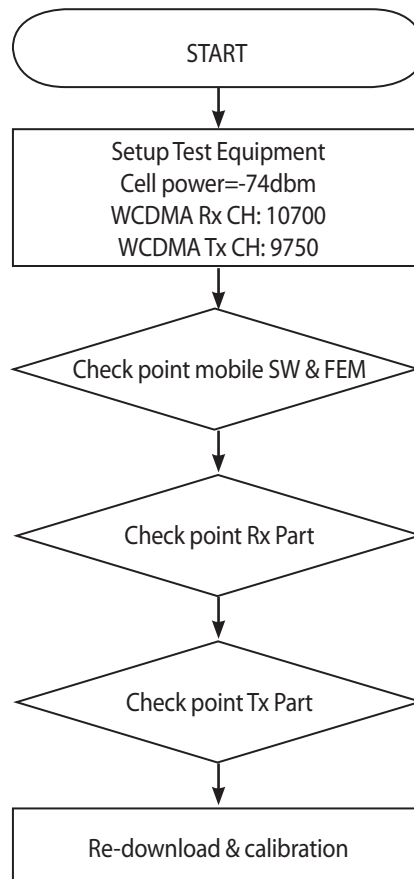
OPERATIONAL MODE	BS	TX_EN
GSM850/900	LOW	HIGH
DSC/PCS	HIGH	HIGH

Table 3.3.3

4. TROUBLE SHOOTING



4.4 Trouble Shooting of WCDMA part

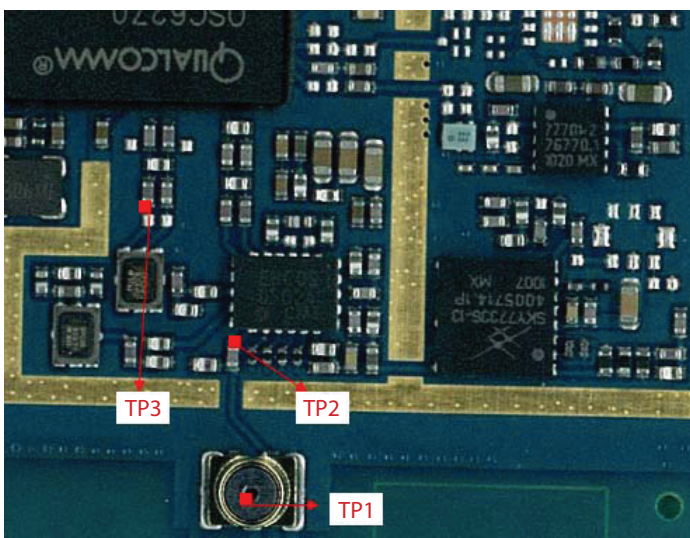
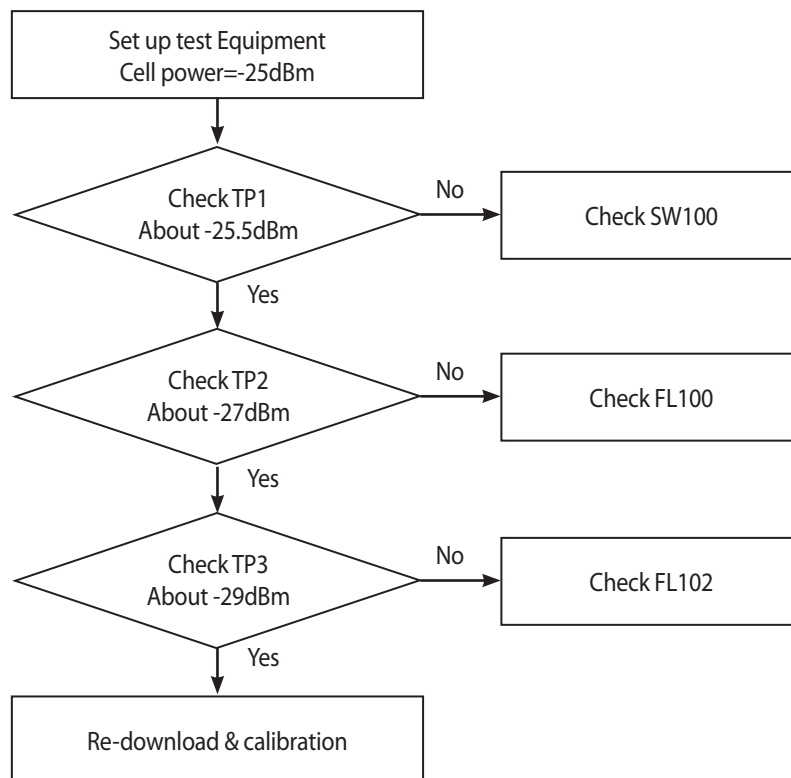


4. TROUBLE SHOOTING

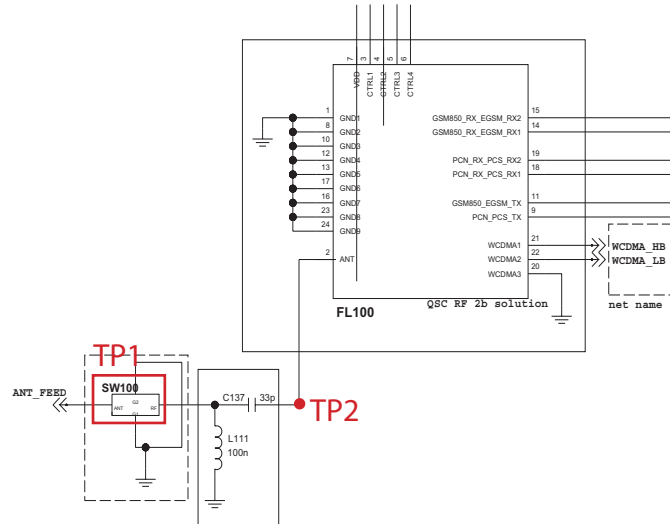
4.4.1 Checking Mobile SW & FEM

Refer to GSM Part (3.3.1)

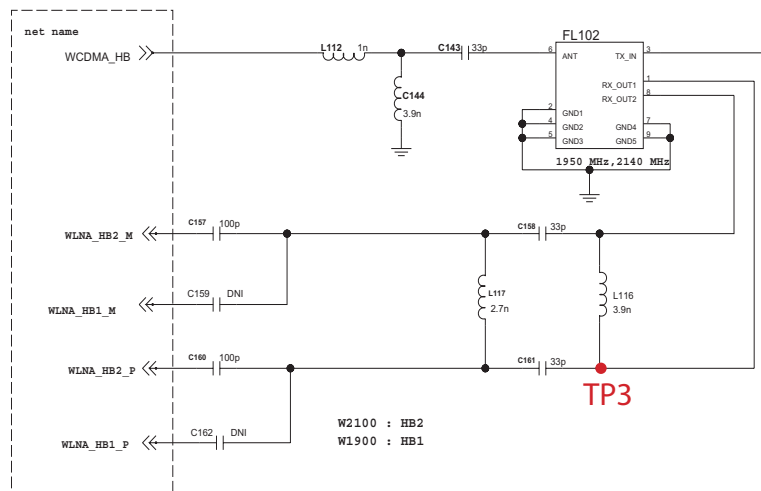
4.4.2 Checking WCDMA Rx



4. TROUBLE SHOOTING

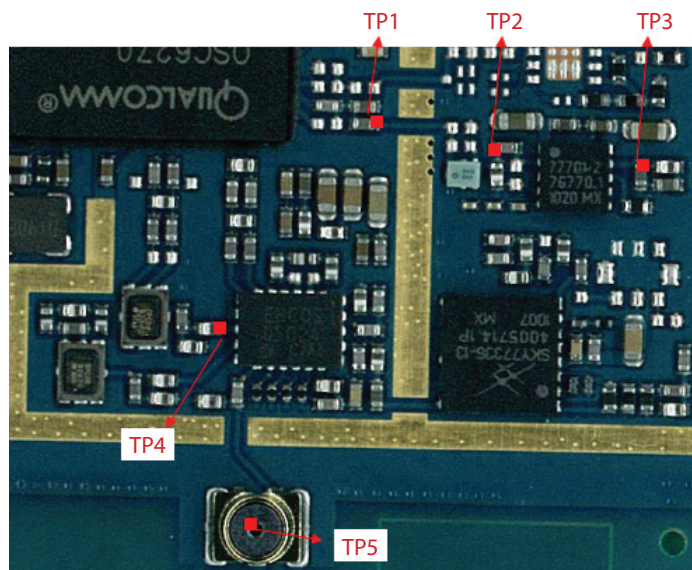
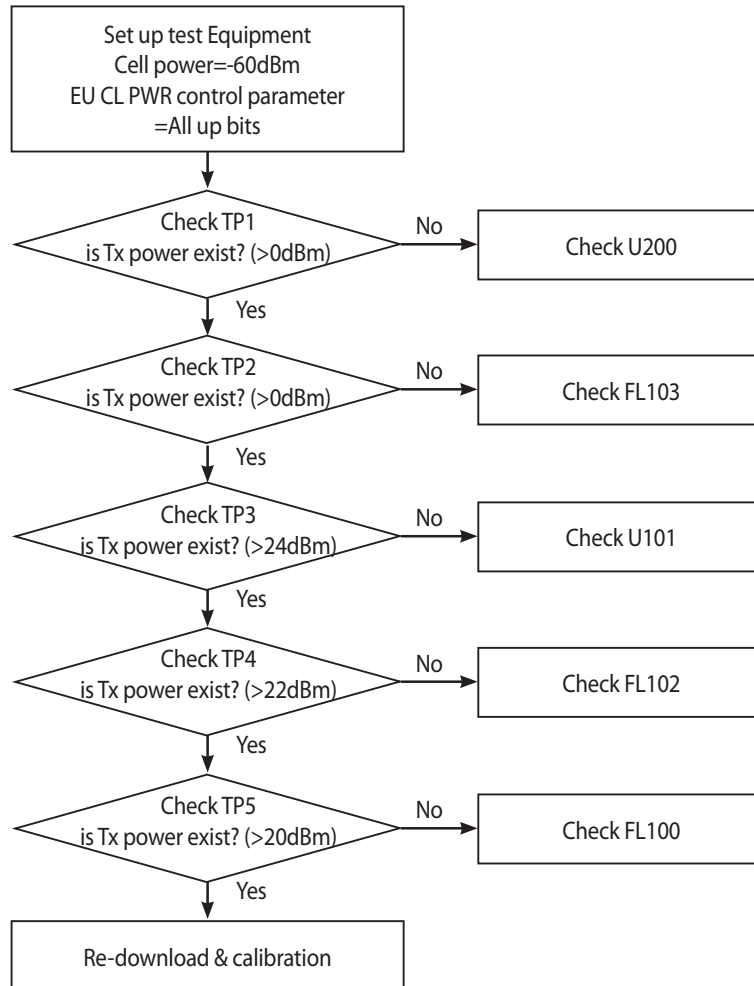


WCDMA_2100 or 1900

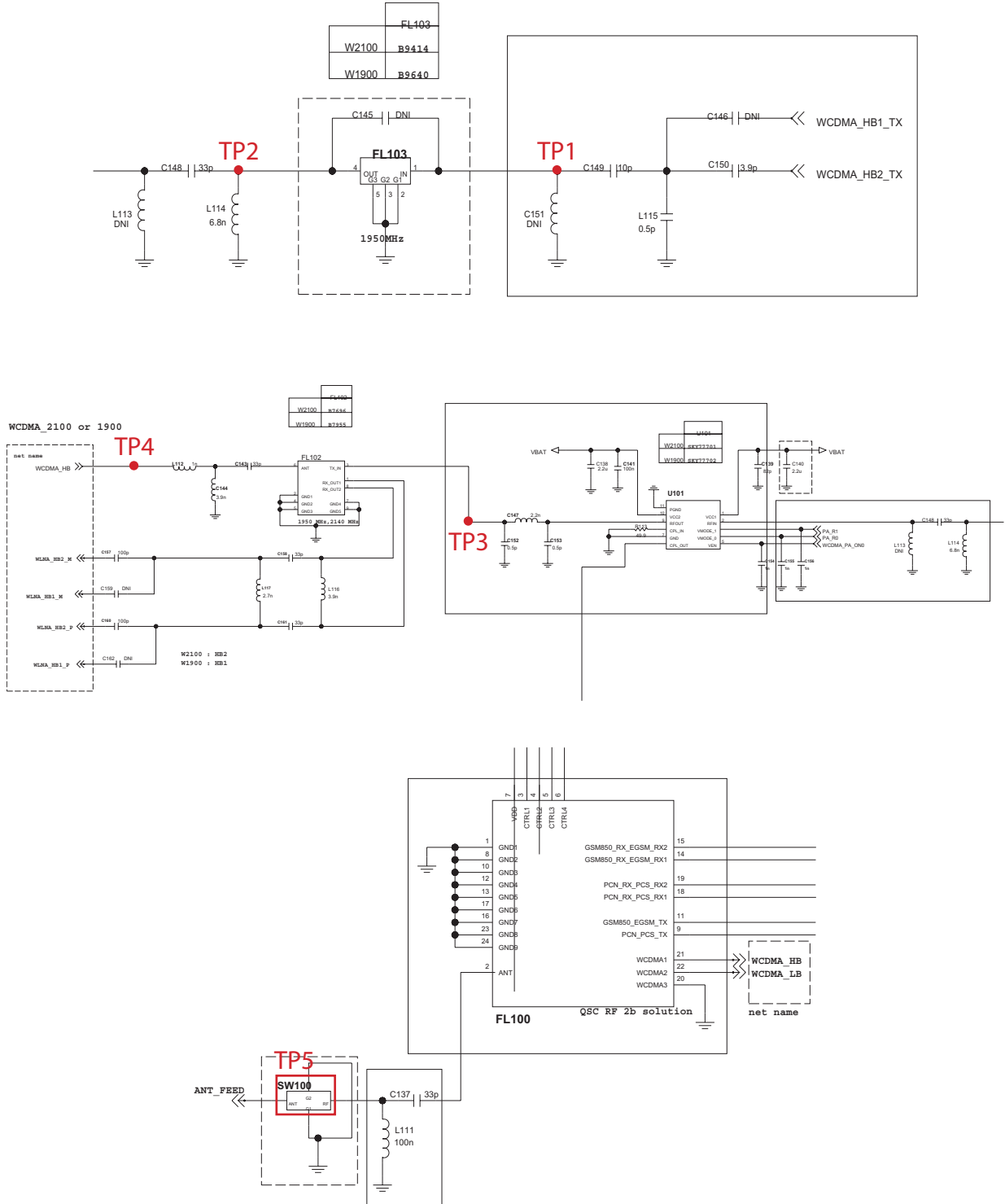


4. TROUBLE SHOOTING

4.4.3 Checking WCDMA Tx part



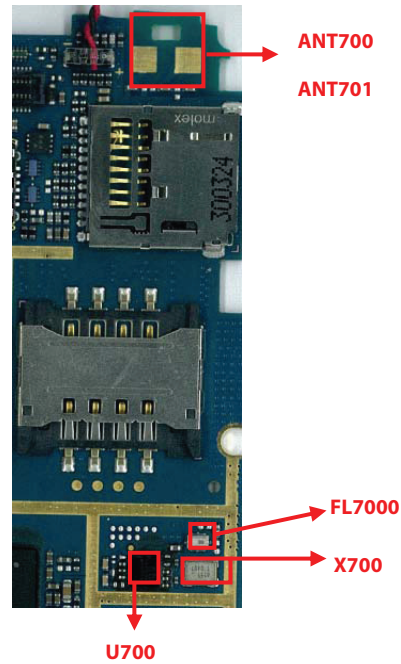
4. TROUBLE SHOOTING



4. TROUBLE SHOOTING

4.5 Checking Bluetooth Block

4.5.1 BLUETOOTH RF components

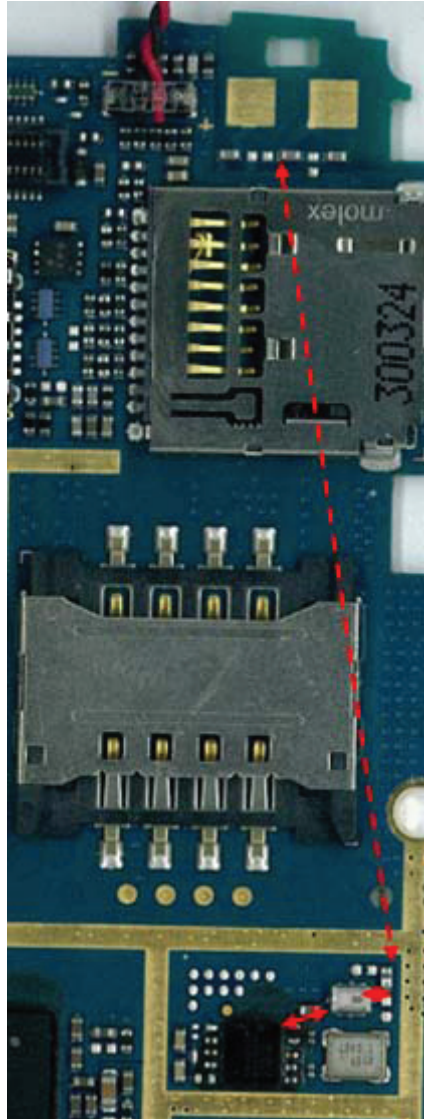


RF component (BT)

- Main board bottom -

Reference	Description
ANT700 ANT701	BT Carrier ANT pad (each pad 2.5x2.5)
U700	BT module_BCM2070
FL700	Band pass filter
X700	26Mhz crystal

4.5.2 BLUETOOTH SIGNAL PATH

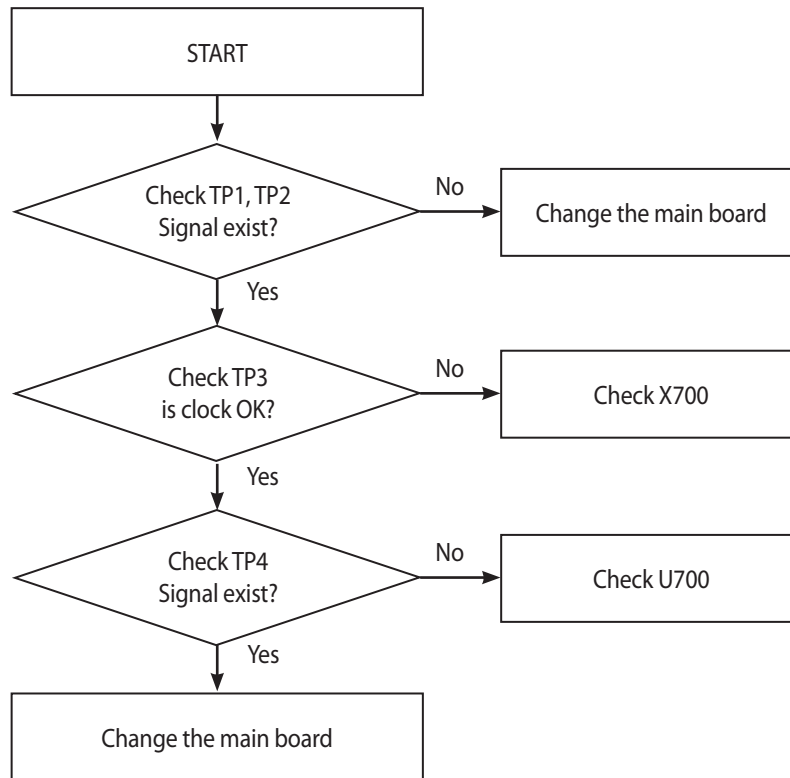


Bluetooth Signal PATH (Main board bottom)

Bluetooth T/Rx PATH

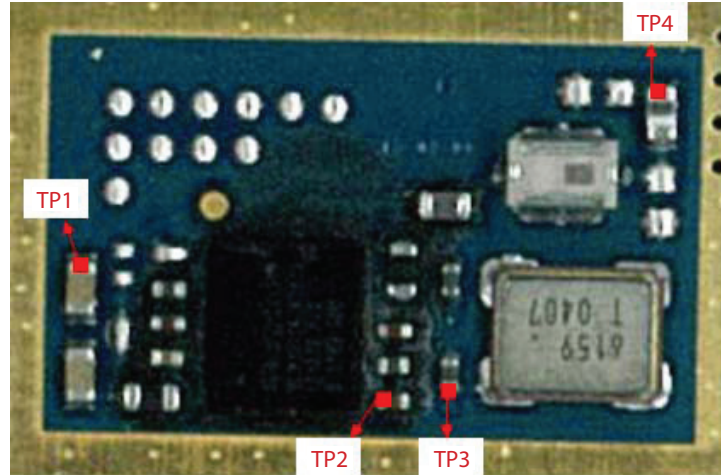
4. TROUBLE SHOOTING

4.5.3 BLUETOOTH Trouble shooting

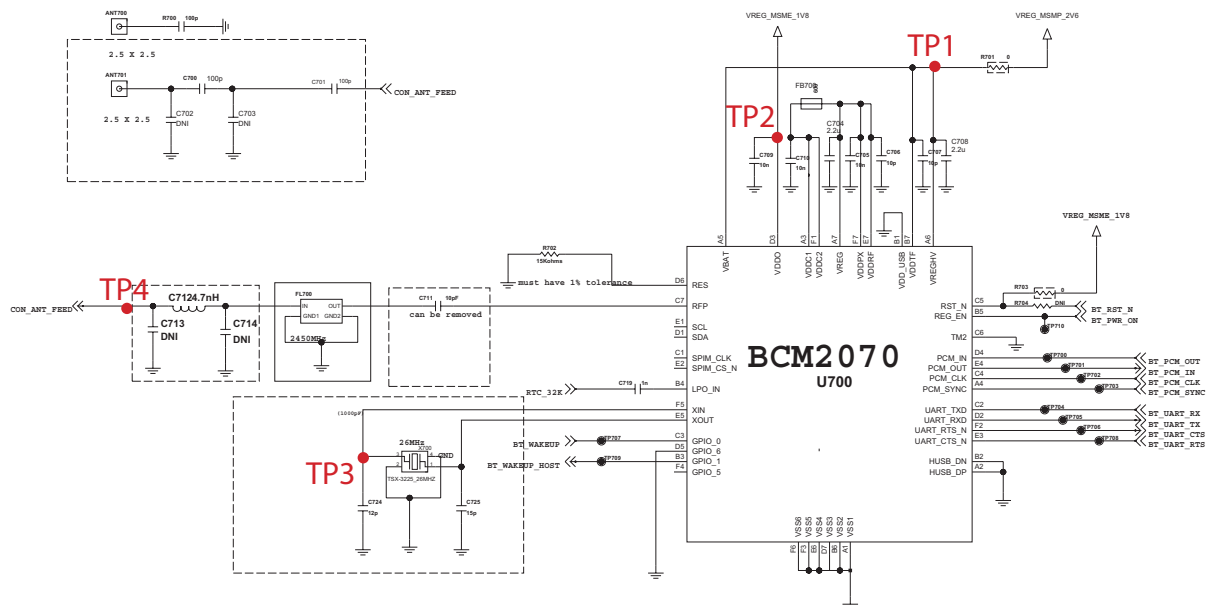


TP#	TP description
TP1	VREG_MSMP_2.6V
TP2	VREG_MSME_1.8V
TP3	BT_CLK(26Mhz)
TP4	BT_ANT_OUT

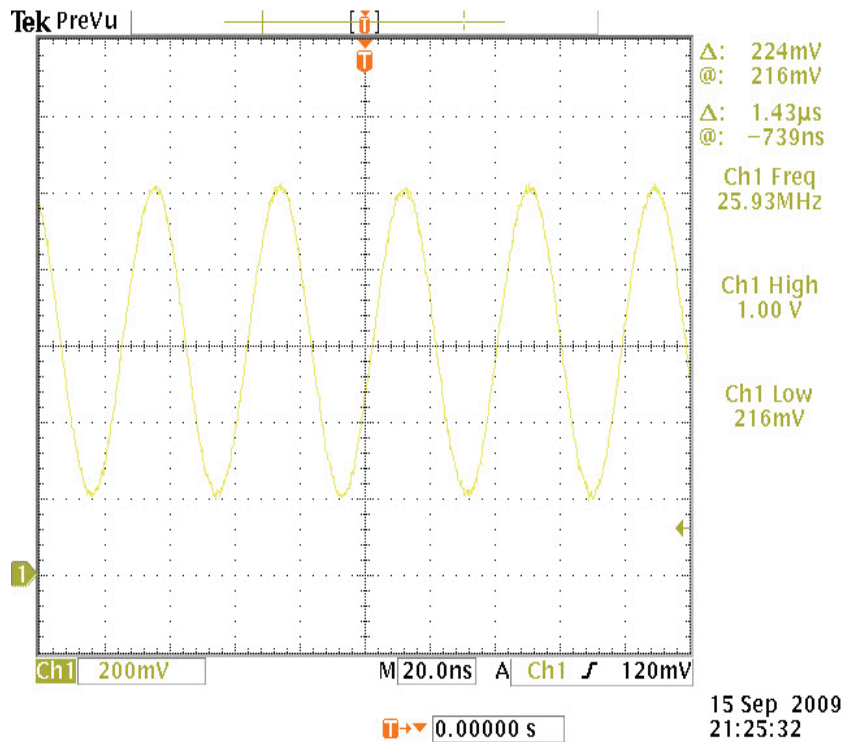
4. TROUBLE SHOOTING



Connectivity_ANT_PAD



4. TROUBLE SHOOTING

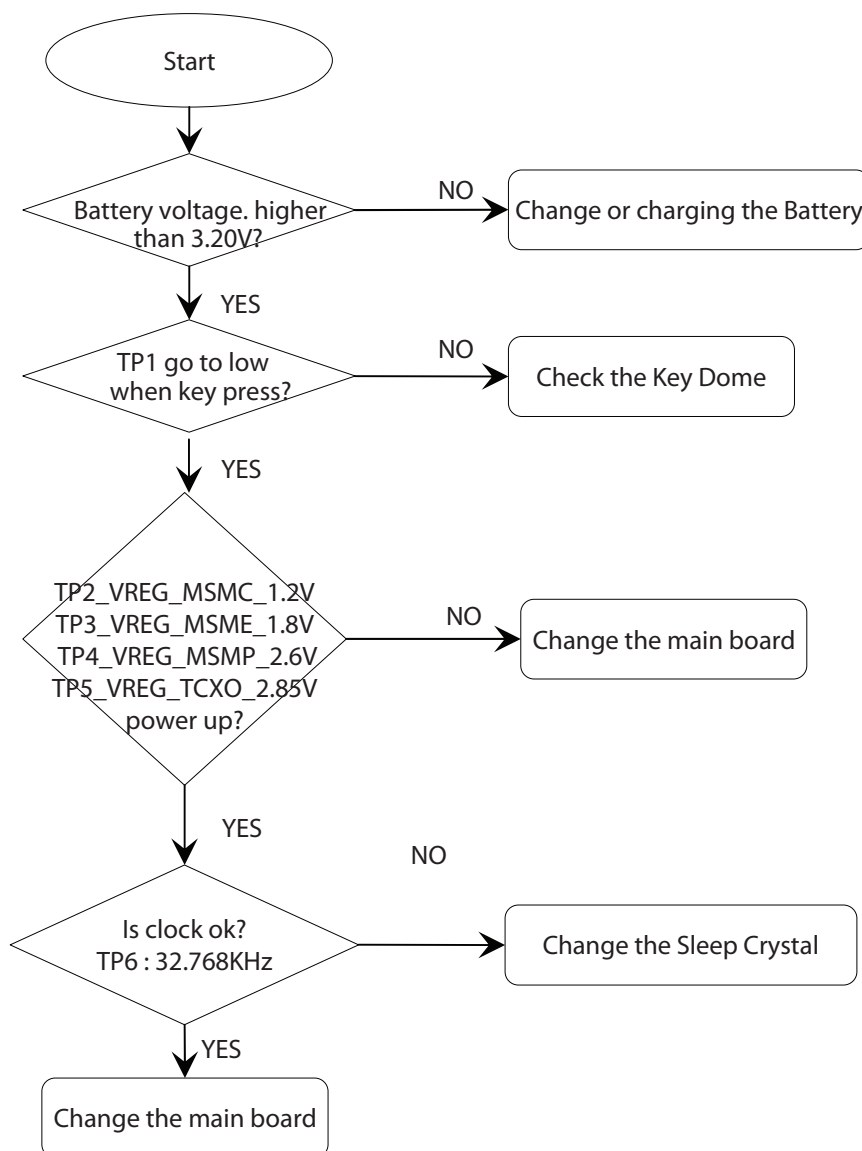


[BT main clk : 26MHz]

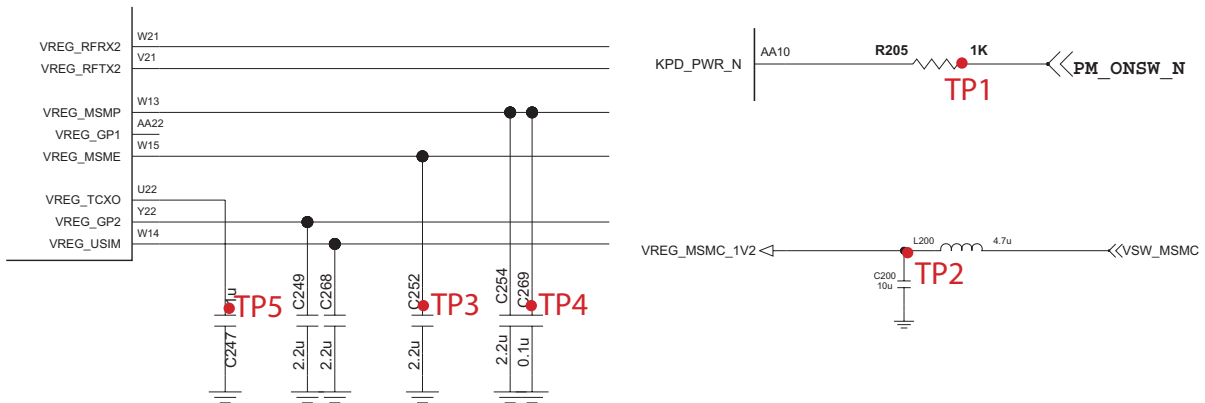
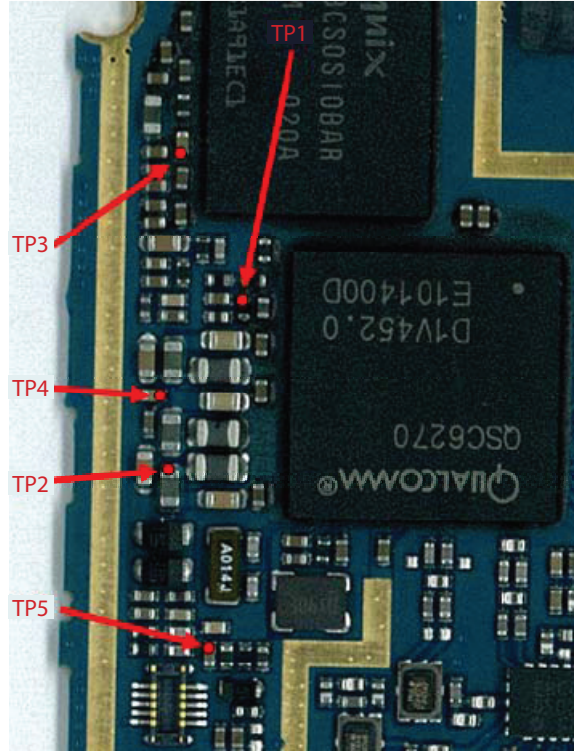
4.6 BB Power ON Troubleshooting

Power On sequence is :

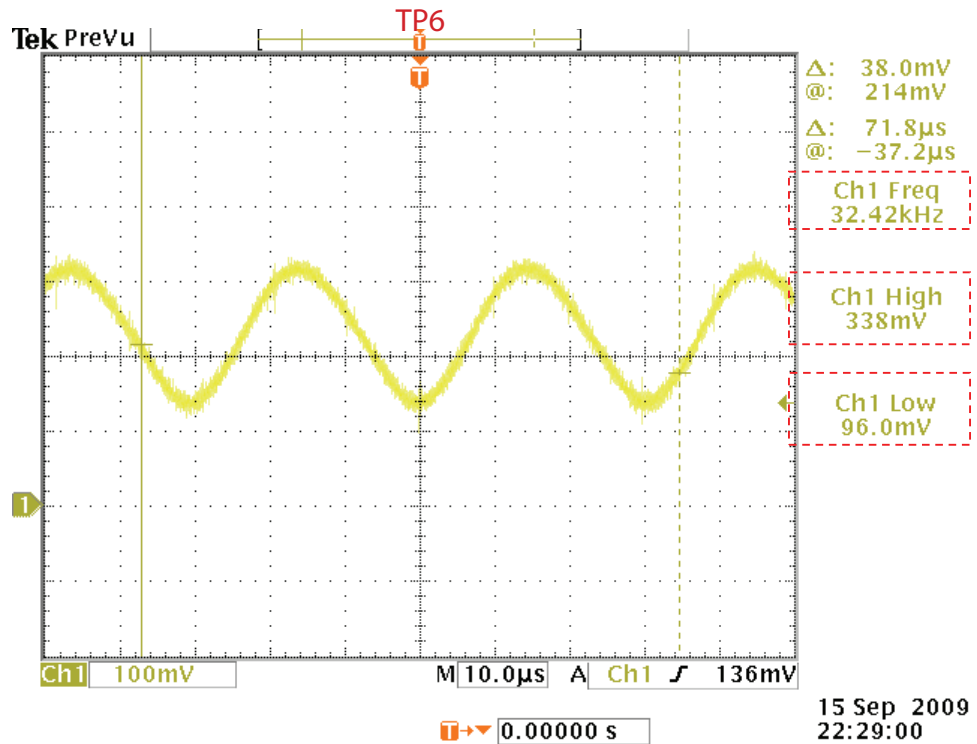
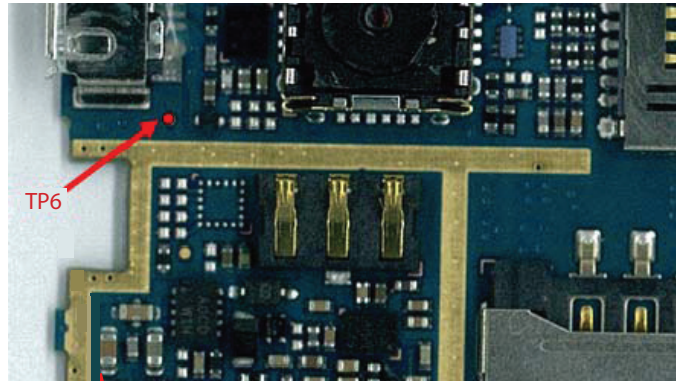
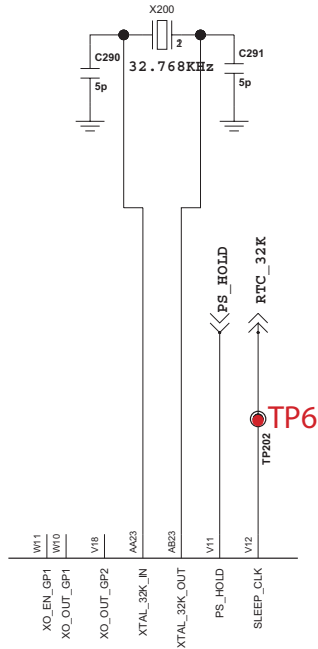
PWR key press PM_ON_SW_N → QSC6270 KPDPWR_N pin(AA2) go to low(KEY BOARD VA1) → QSC6270 Power Up → VREG_MSMC_1.2V(C261), VREG_MSME_1.8V(C209), VREG_MSMP_2.6V(C414), VREG_RFRX2_1.3V(C232), VREG_TCXO_2.85V(C239) power up and system reset assert to QSC6270 → Phone booting and PS_HOLD assert to QSC6270



4. TROUBLE SHOOTING



4. TROUBLE SHOOTING



Sleep Crystal (32.768kHz)

4. TROUBLE SHOOTING

4.7 Charger Troubleshooting

☞ Charging Procedure

- Connect TA or USB Cable
- Control the charging current by Single Charger
- Charging current flows into the battery

☞ Check Point

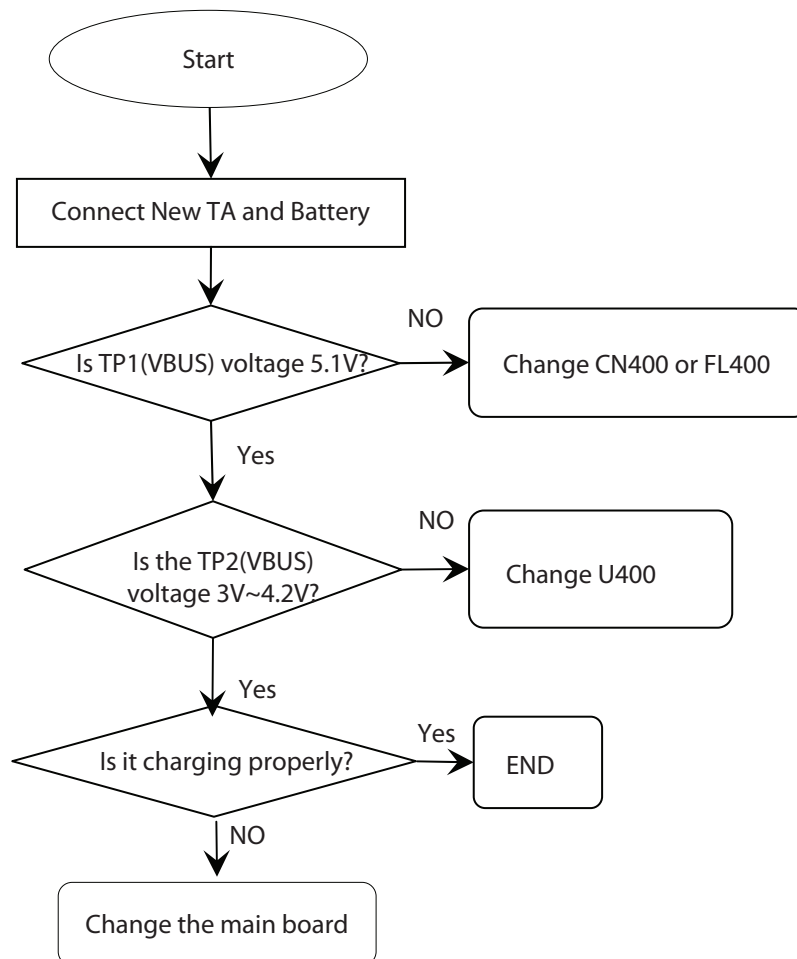
- Connection of TA or USB Cable
- Charging current path
- Battery

☞ Troubleshooting Setup

- Connect TA and battery to the phone

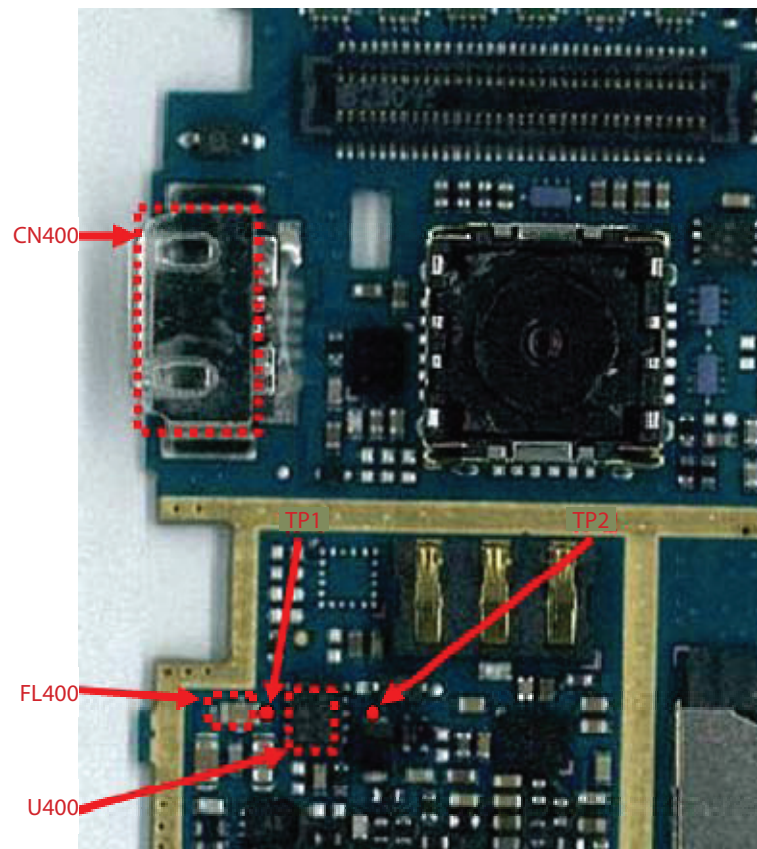
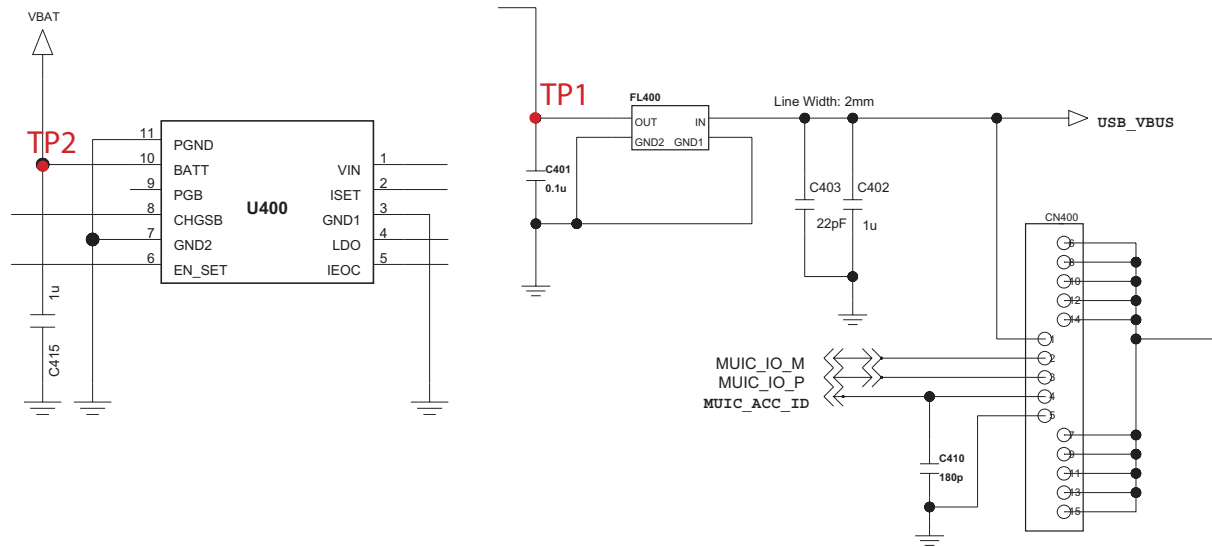
☞ Troubleshooting Procedure

- Check the charger (TA or USB Cable) connector
- Check the charging current Path
- Check the battery



[Charger Troubleshooting Flow]

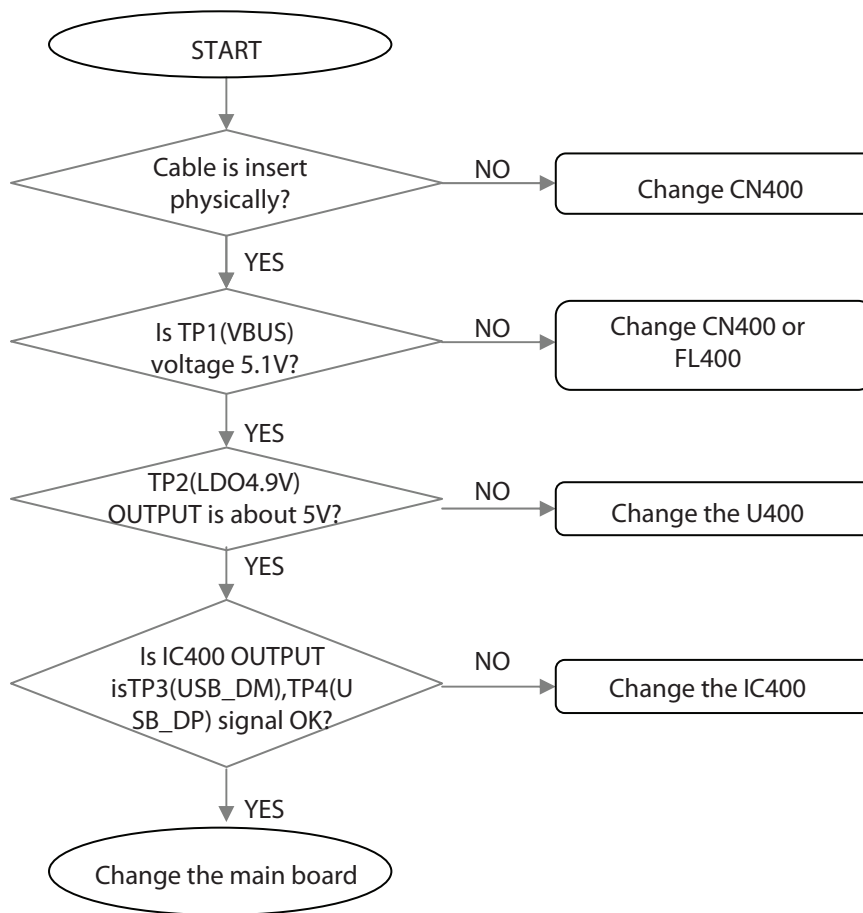
4. TROUBLE SHOOTING



4. TROUBLE SHOOTING

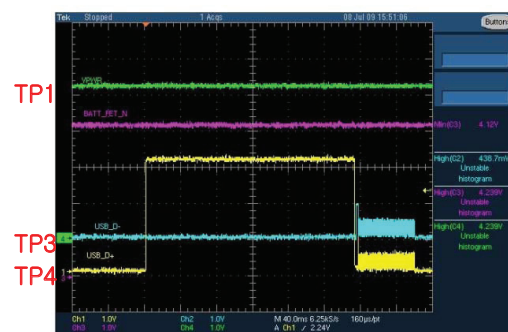
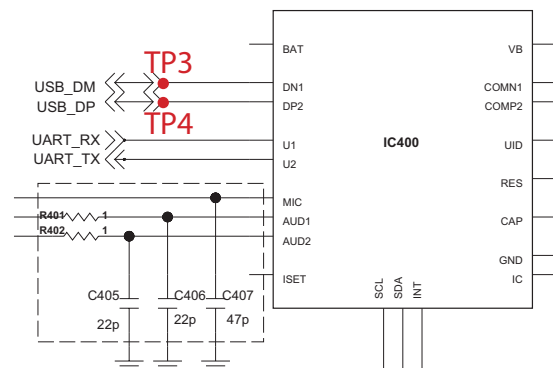
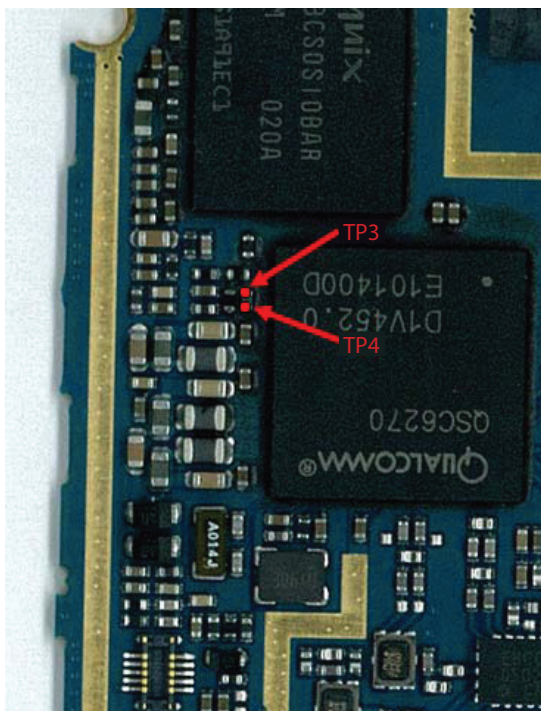
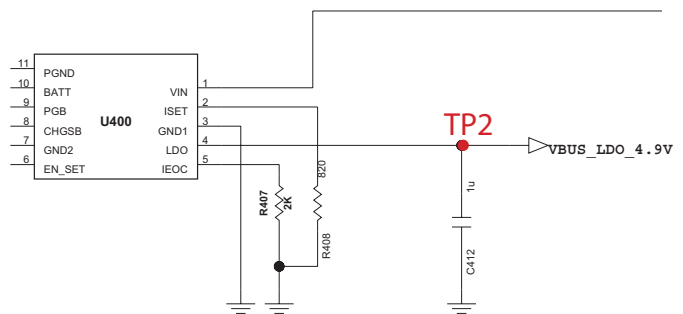
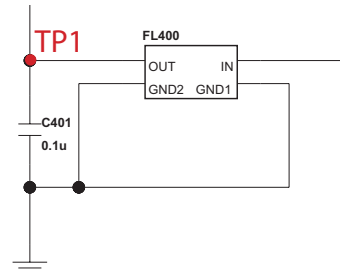
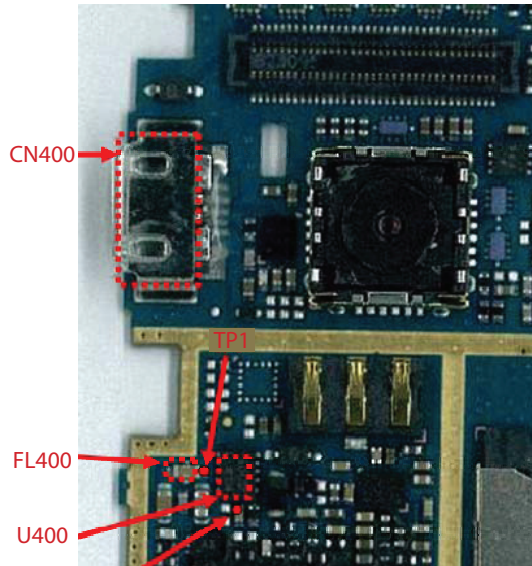
4.8 USB Troubleshooting

USB Initial sequence is : Insert USB Cable → USB_VBUS +5V Check → IC400 triggered
USB IF work



[USB Troubleshooting Flow]

4. TROUBLE SHOOTING

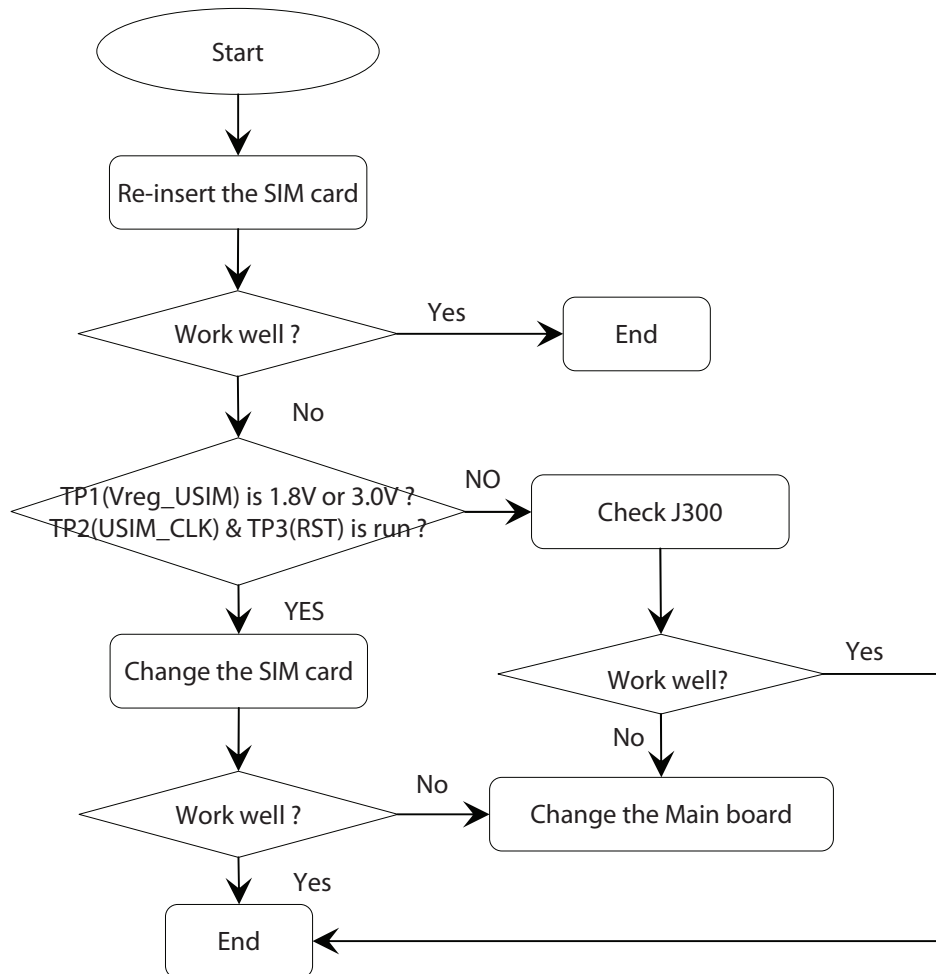


4. TROUBLE SHOOTING

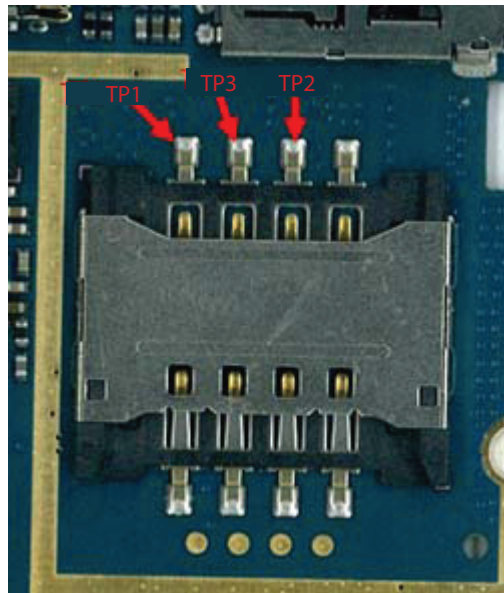
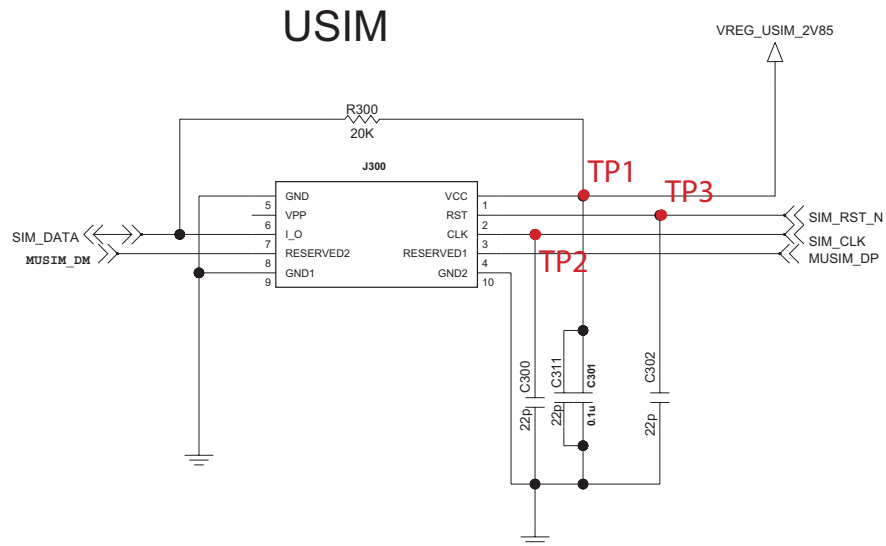
4.9 USIM Troubleshooting

USIM Initial sequence is :

VREG_USIM_2.85V go to 1.8V or 3.0V → USIM_CLK,USIM_RST,USIM_DATA triggered → USIM IF work



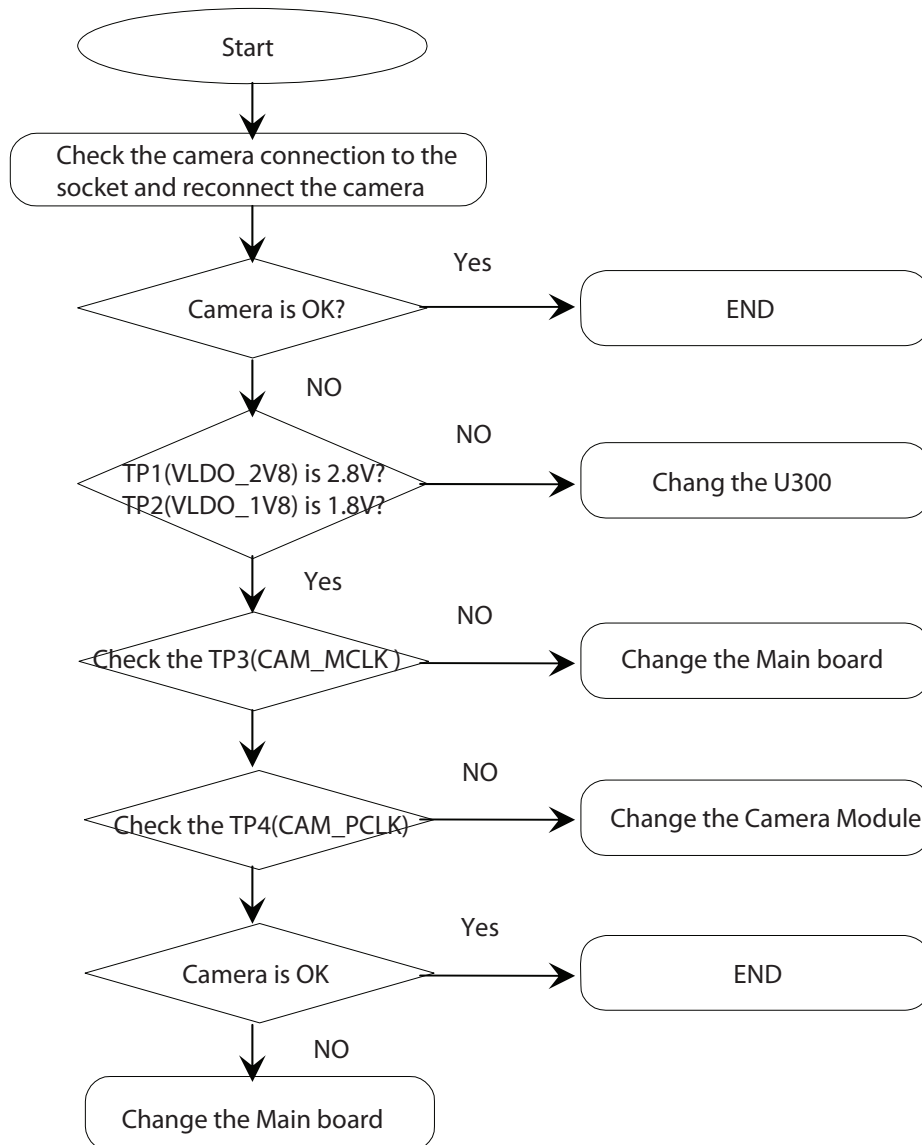
4. TROUBLE SHOOTING



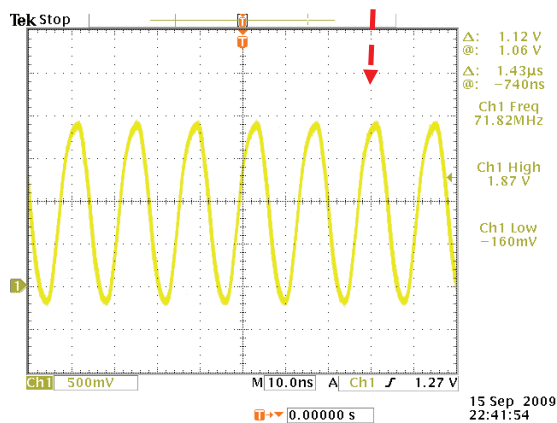
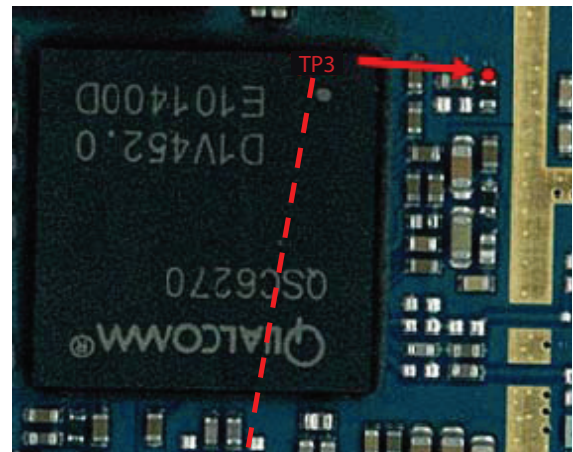
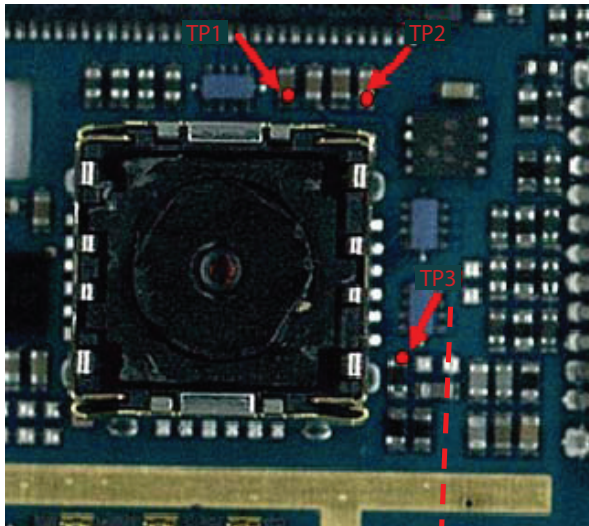
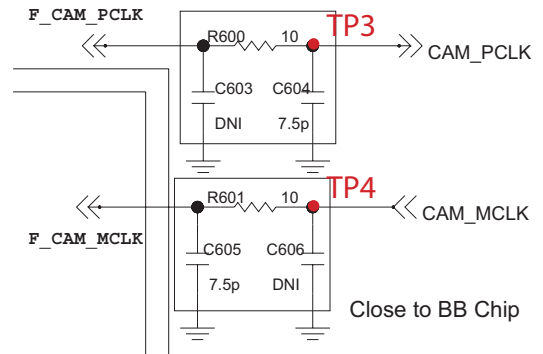
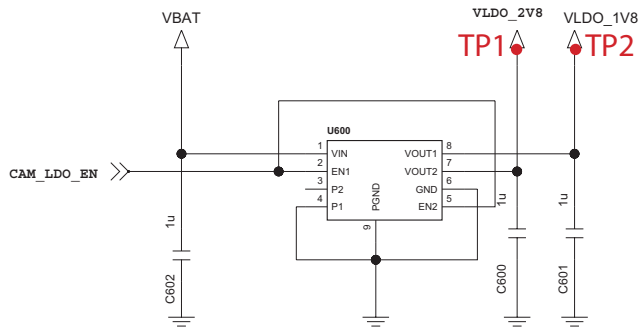
4. TROUBLE SHOOTING

4.10 Camera Troubleshooting (5M CAMERA)

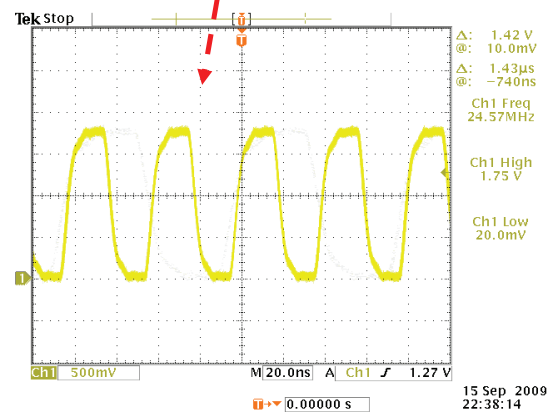
Camera control signals are generated by Q5C6270.



4. TROUBLE SHOOTING



CAM_70MHz PCLK



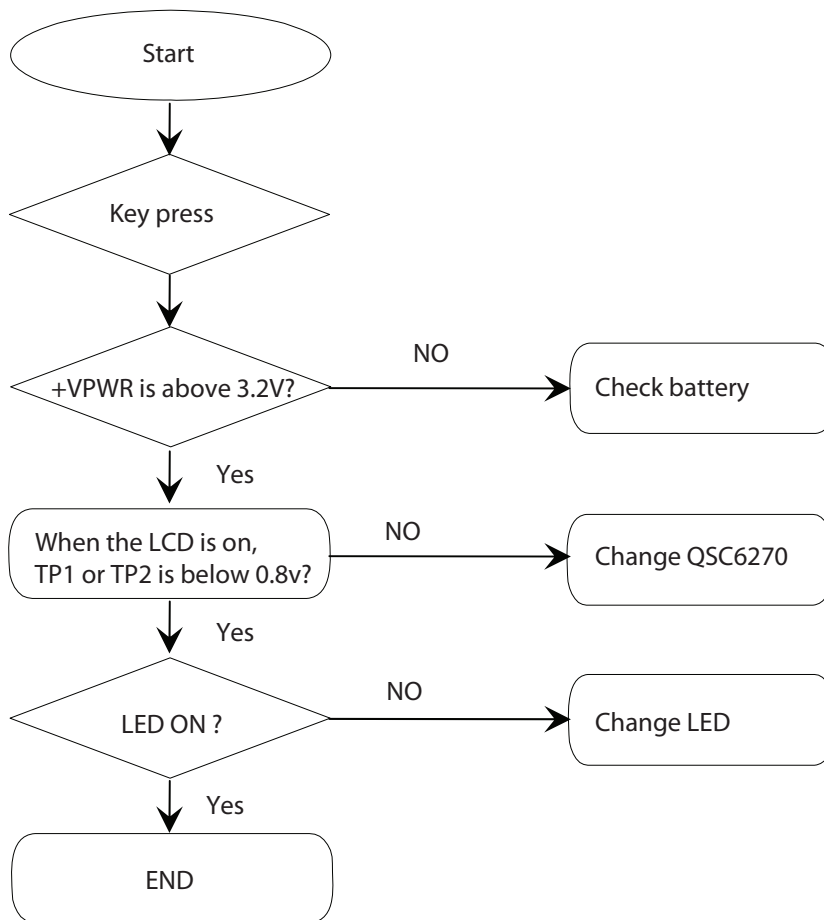
CAM_24MHz MCLK

4. TROUBLE SHOOTING

4.11 Main/Slide KEY LED Troubleshooting

MAIN and Slide Key Pad LED is on as below :

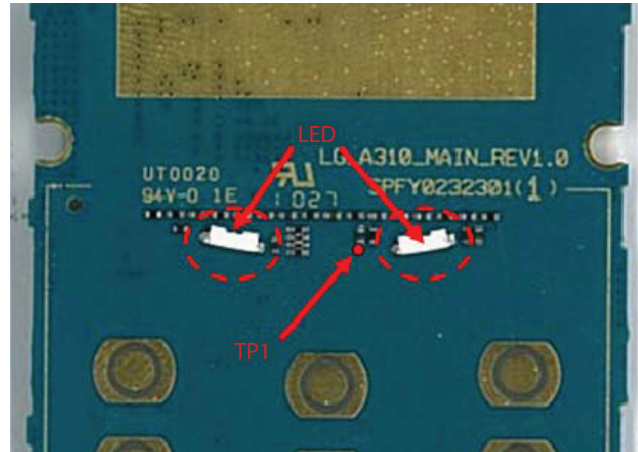
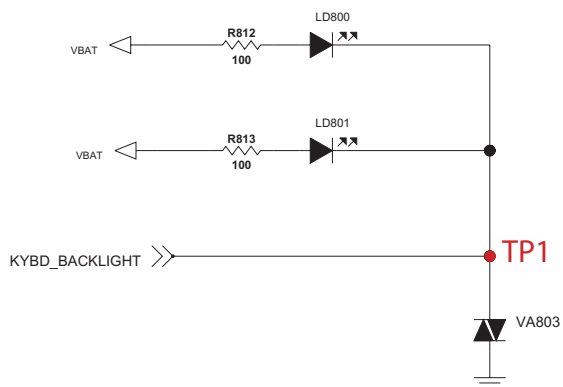
Key pressing → LED_CON go down low (below 0.8v) → MAIN Key Backlight LED On



4. TROUBLE SHOOTING

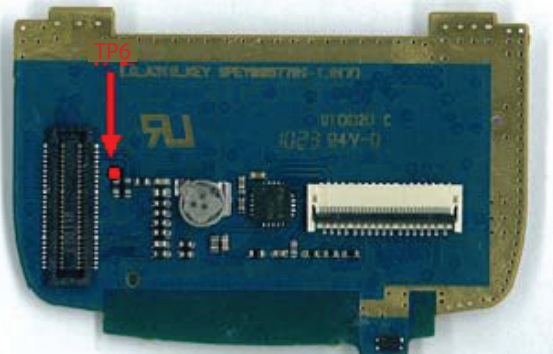
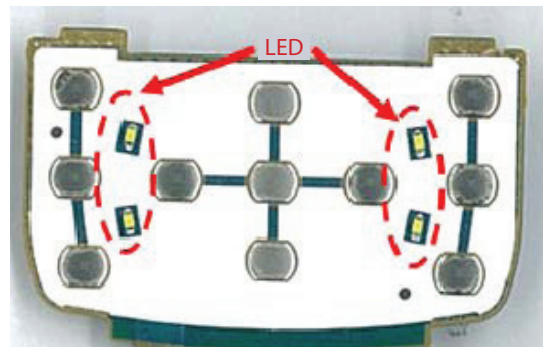
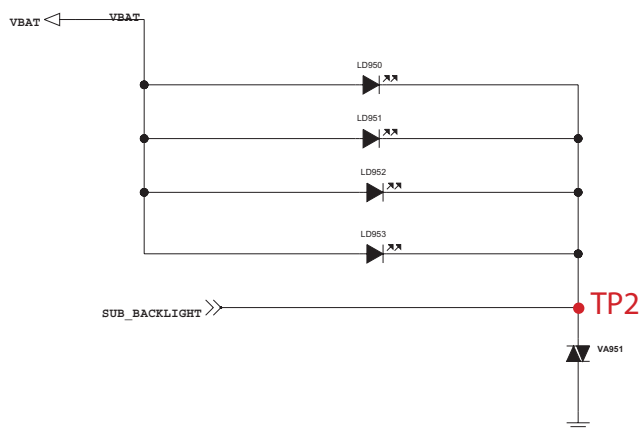
MAIN

KEY BACKLIGHT LED(2EA)



SLIDE

KEY LED

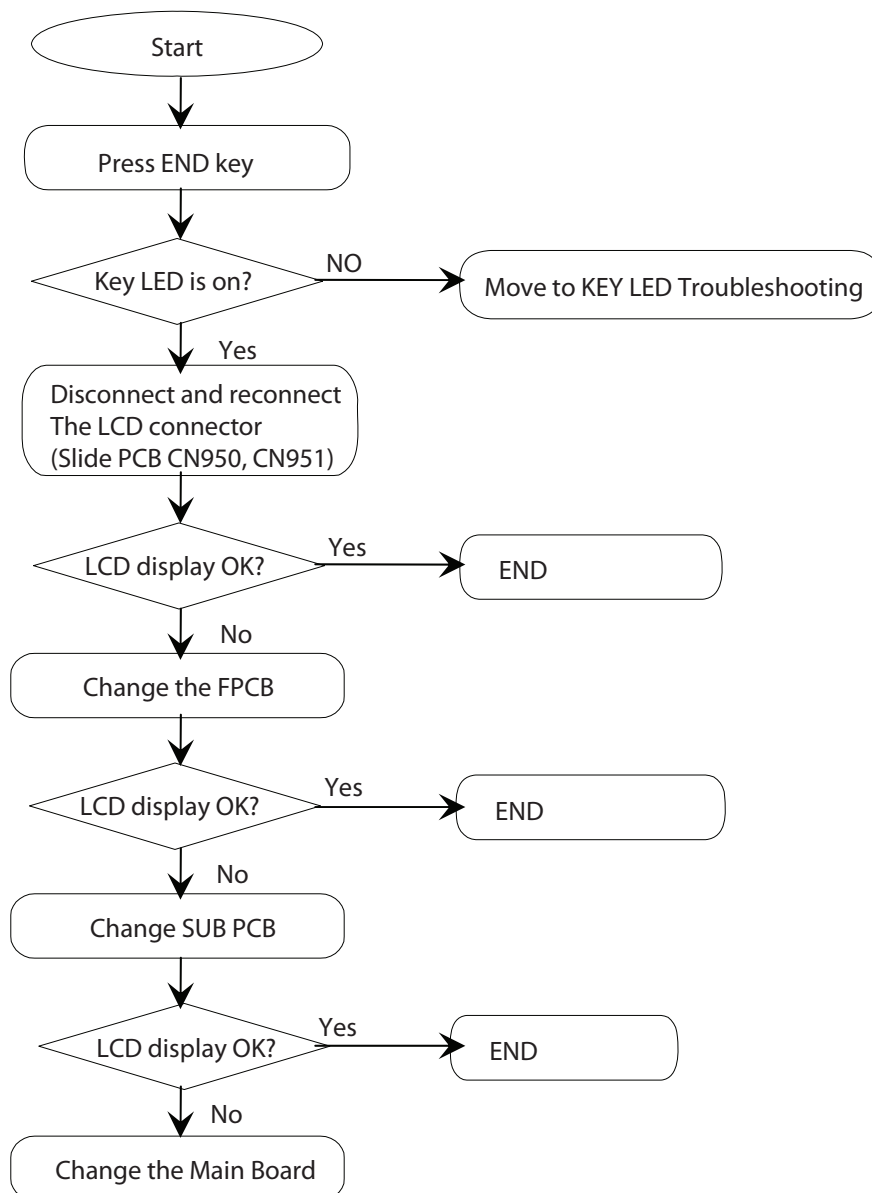


4. TROUBLE SHOOTING

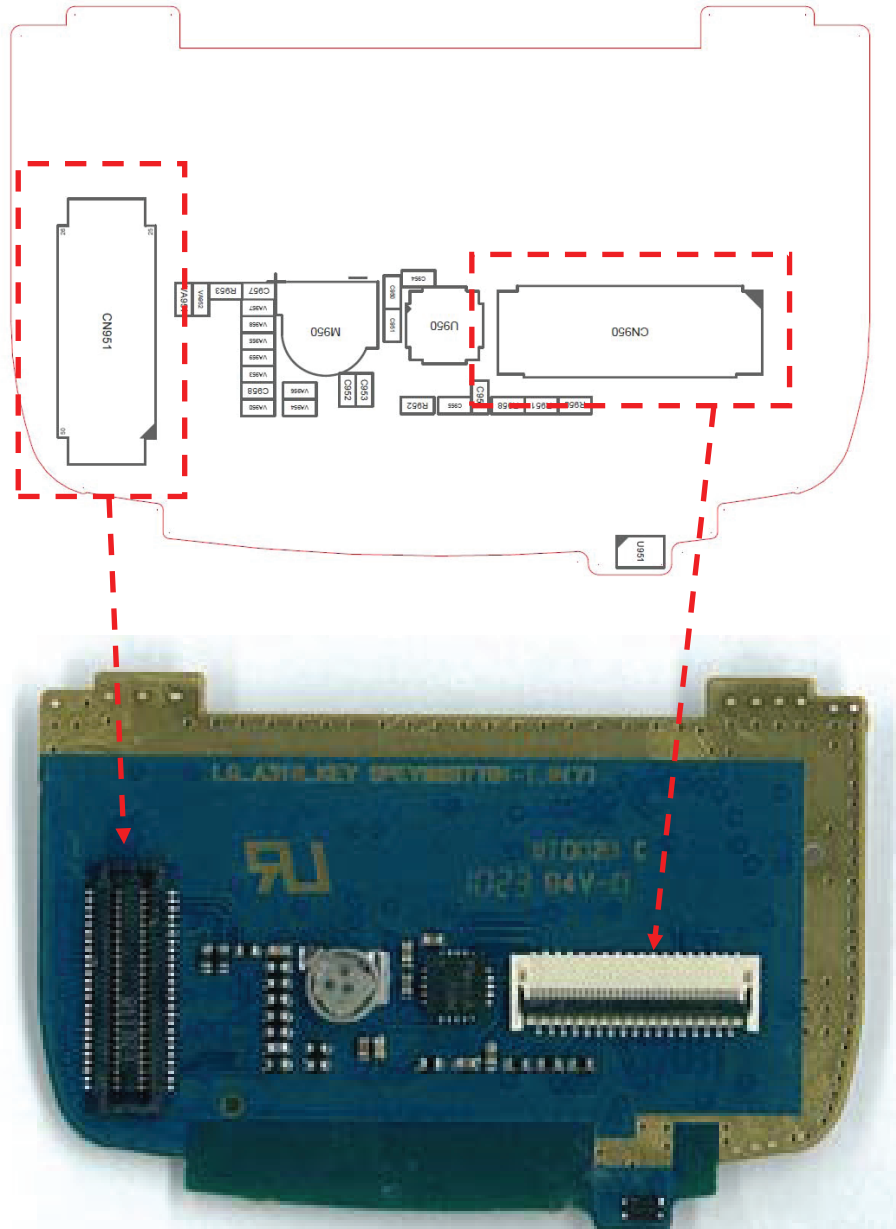
4.12 LCD Troubleshooting

LCD control signals are generated by QSC6270.

The signal path is : QSC6270 → CN102 → LCD Module



4. TROUBLE SHOOTING

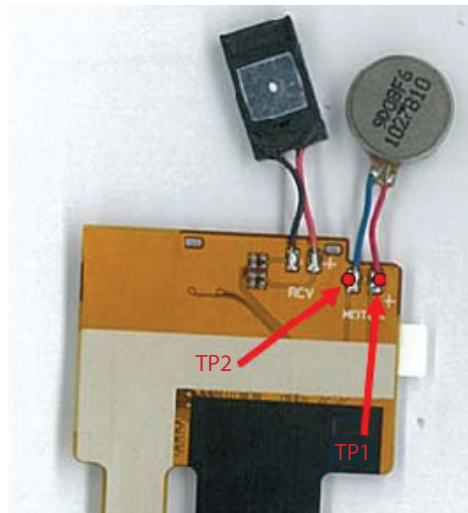
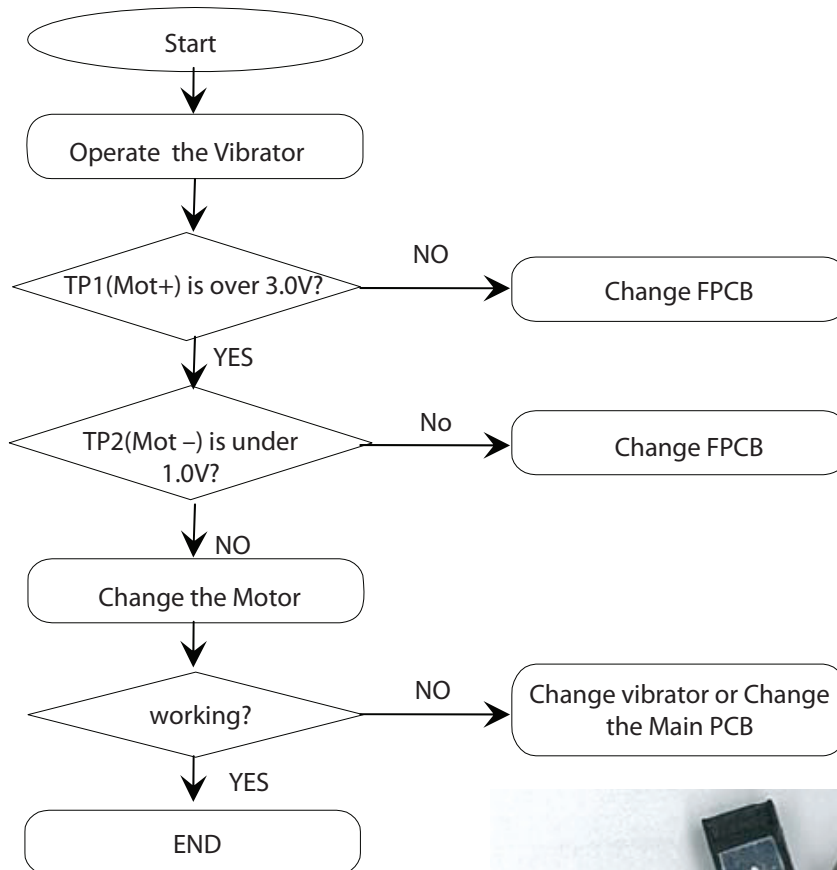


[Slide Side view placement]

4. TROUBLE SHOOTING

4.13 Vibrator Troubleshooting

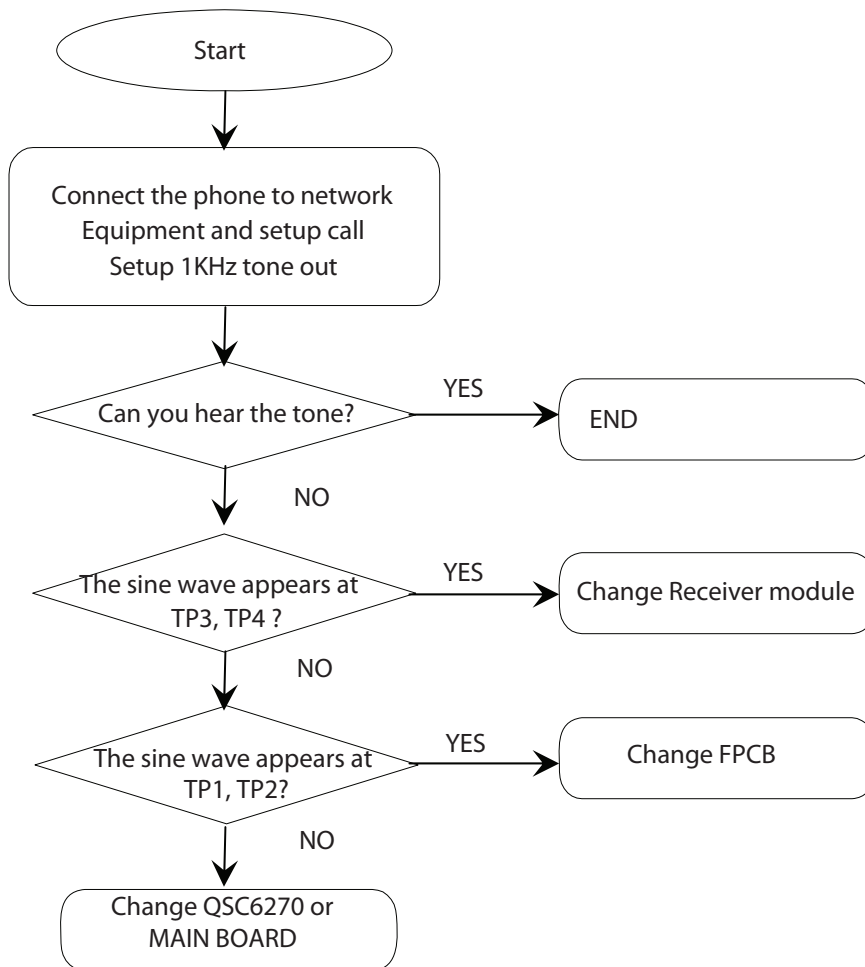
Vibrator is operate when DC motor driver is enabled.



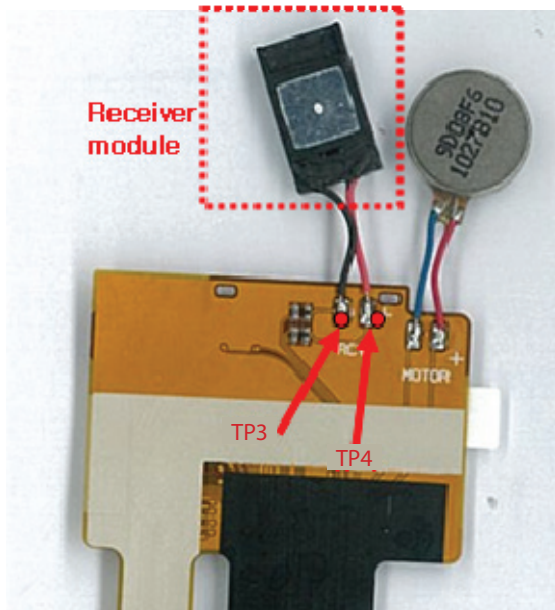
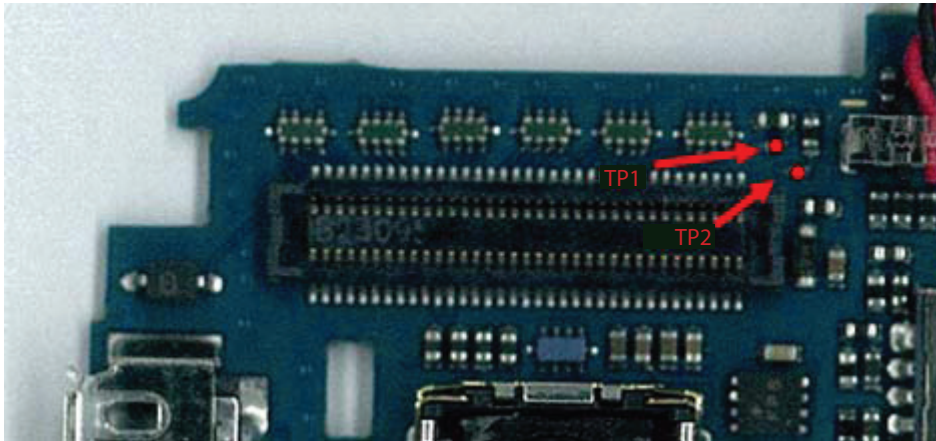
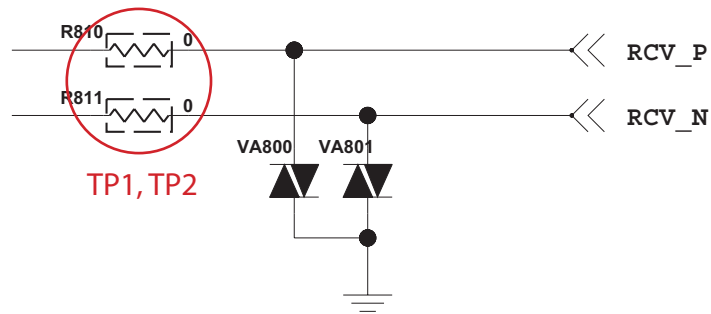
[LCD FPCB]

4.14 Receiver Path

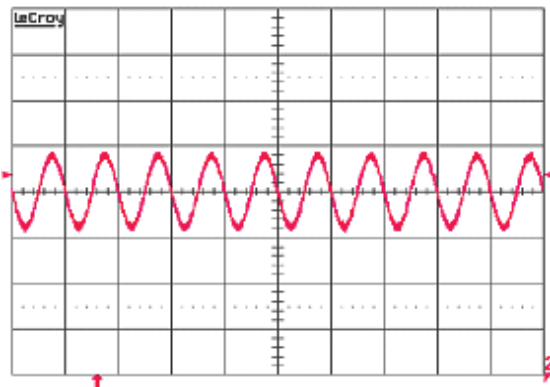
QSC6270 Output → FPCB Receiver Pad



4. TROUBLE SHOOTING

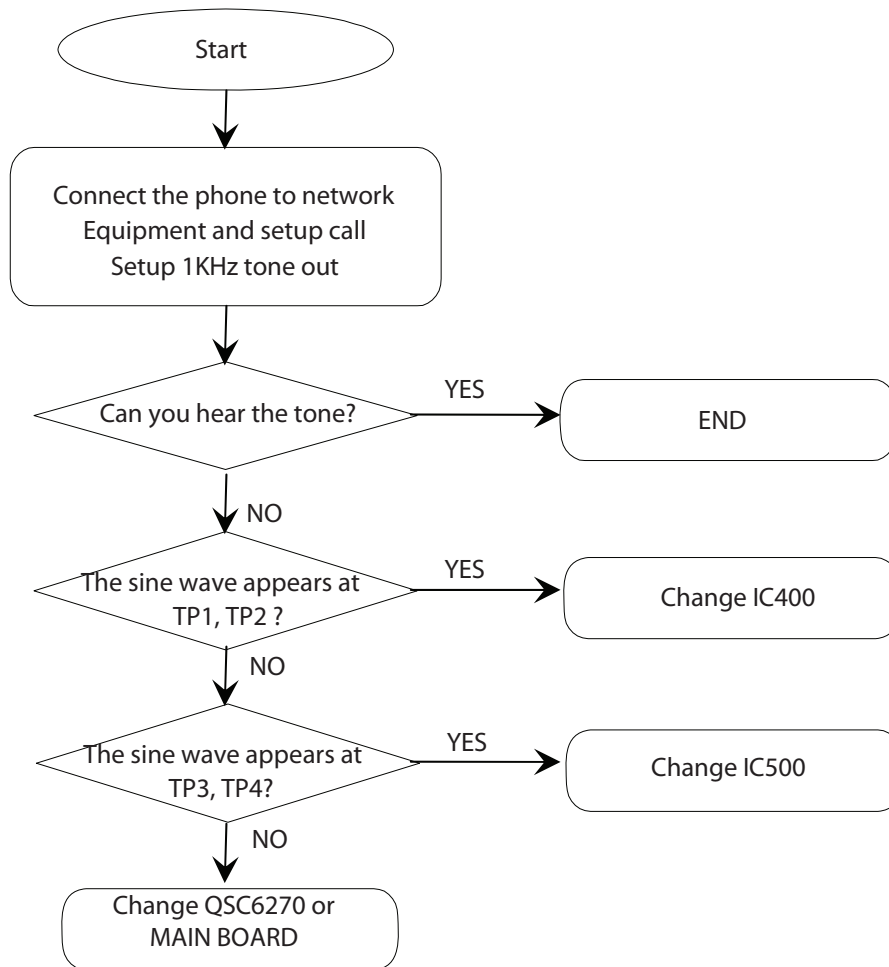


TP1, TP2, TP3, TP4 SINE WAVE

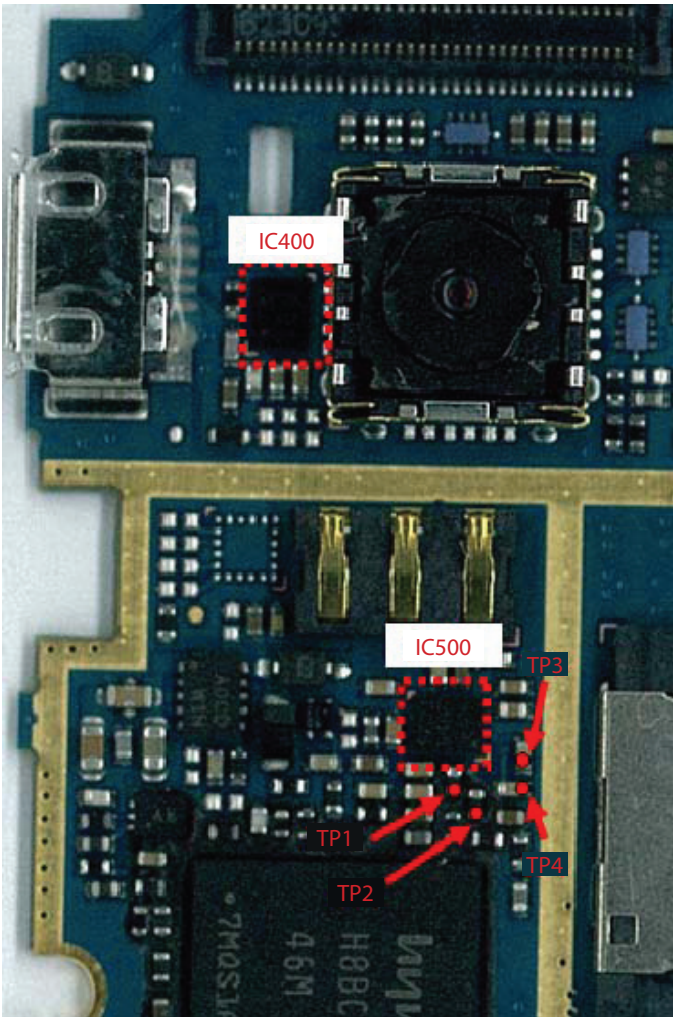
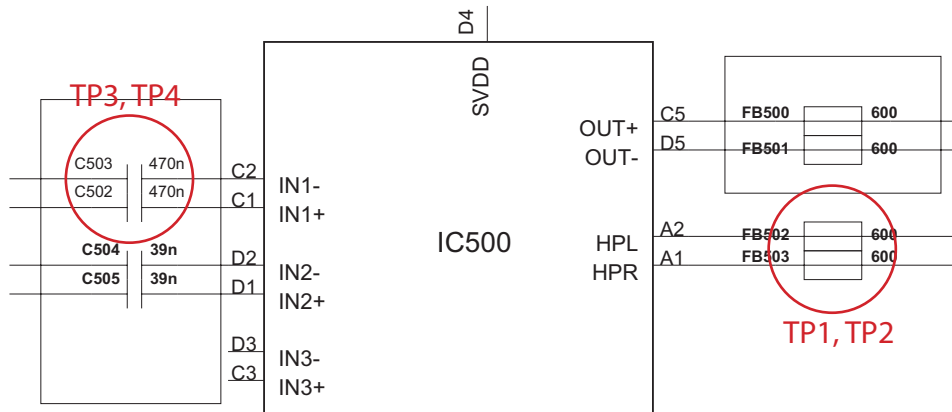


4.15 Headset path

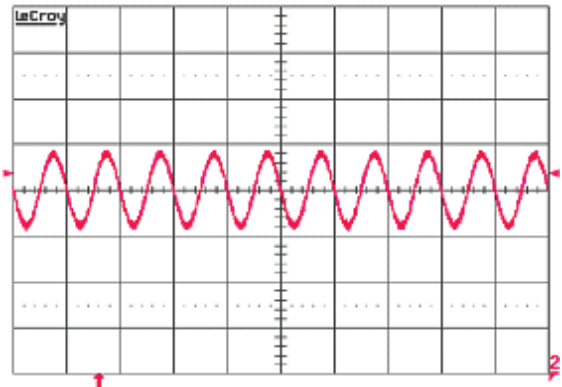
QSC6270 Output → IC500(Audio Sub System) → IC400(MUIC) → CN400 (u USB Connector)



4. TROUBLE SHOOTING

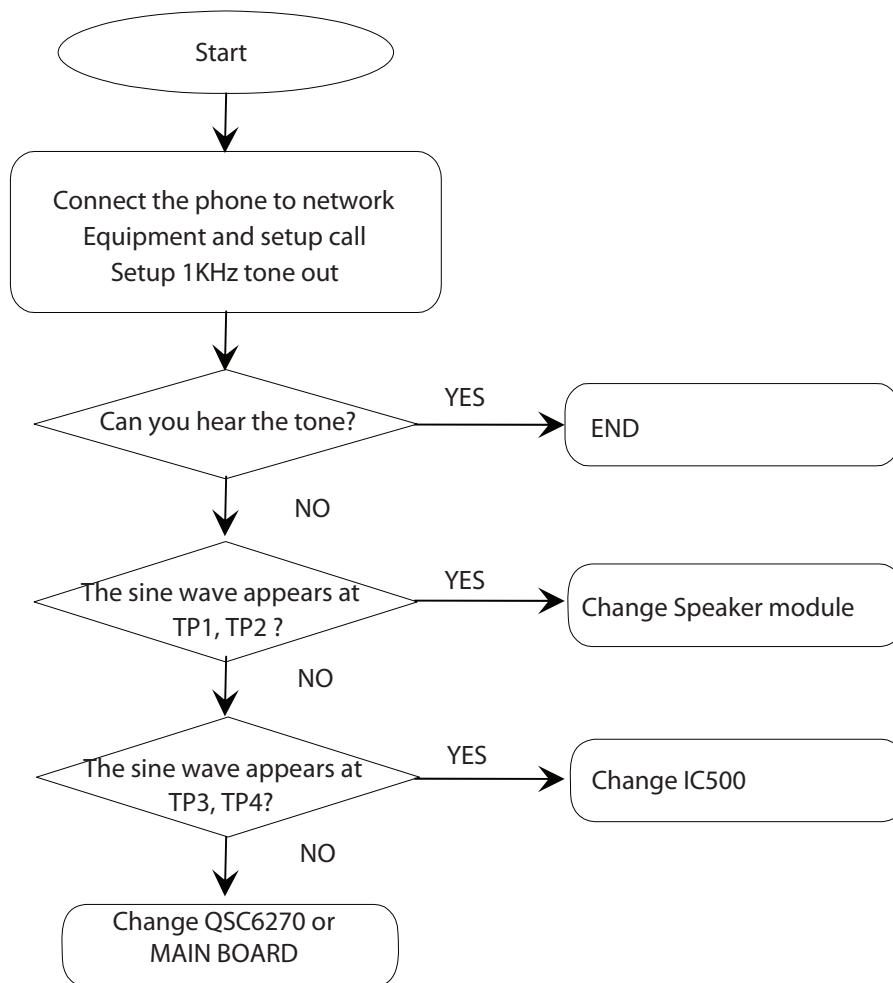


TP1, TP2, TP3, TP4 SINE WAVE

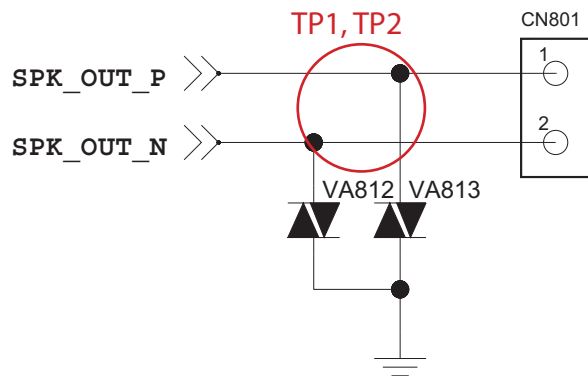
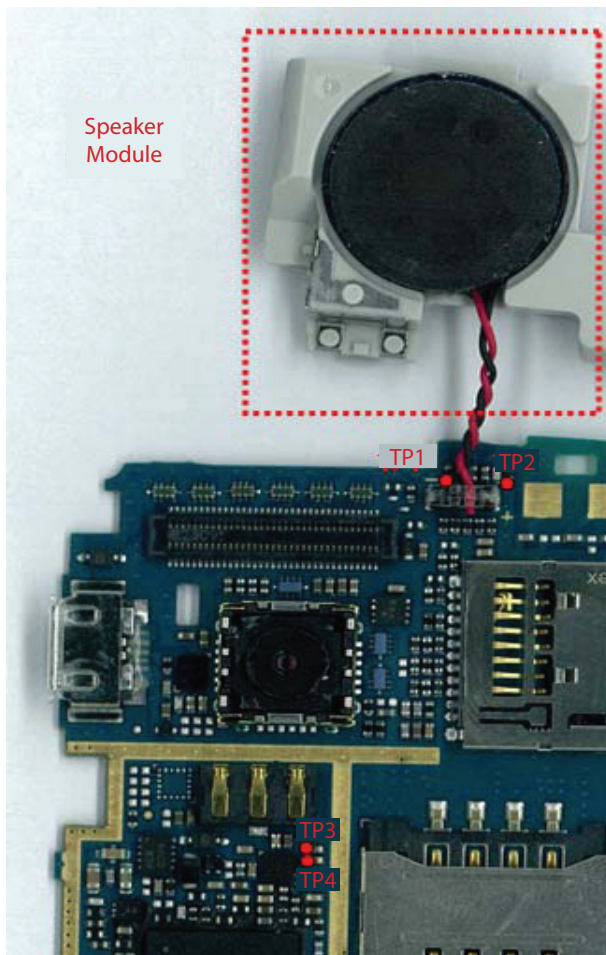
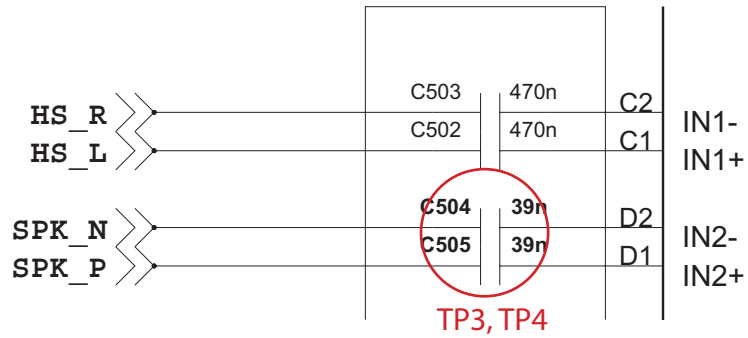


4.16 Speaker path

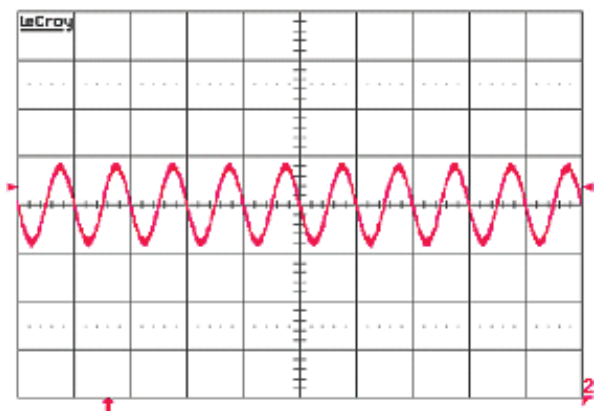
QSC6270 Output → IC500(Audio Sub System) → Speaker module



4. TROUBLE SHOOTING

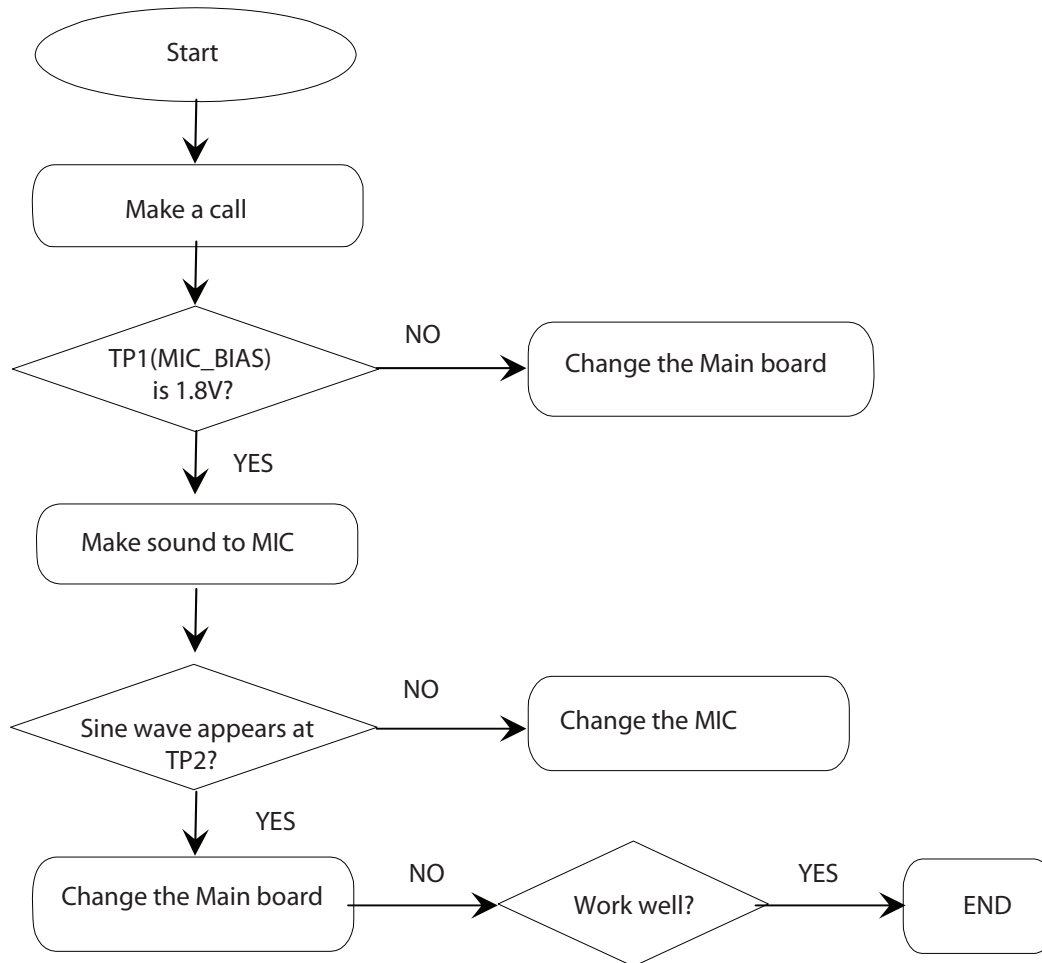


TP1, TP2, TP3, TP4 SINE WAVE

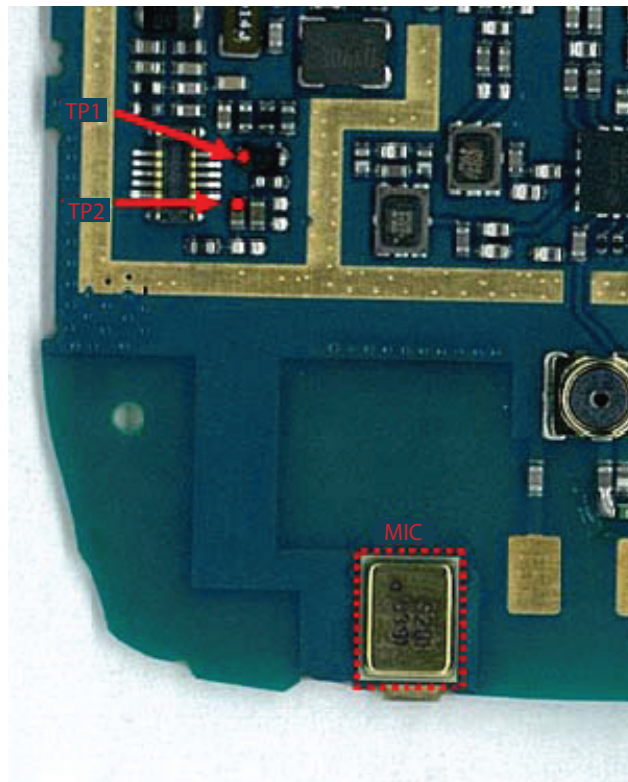
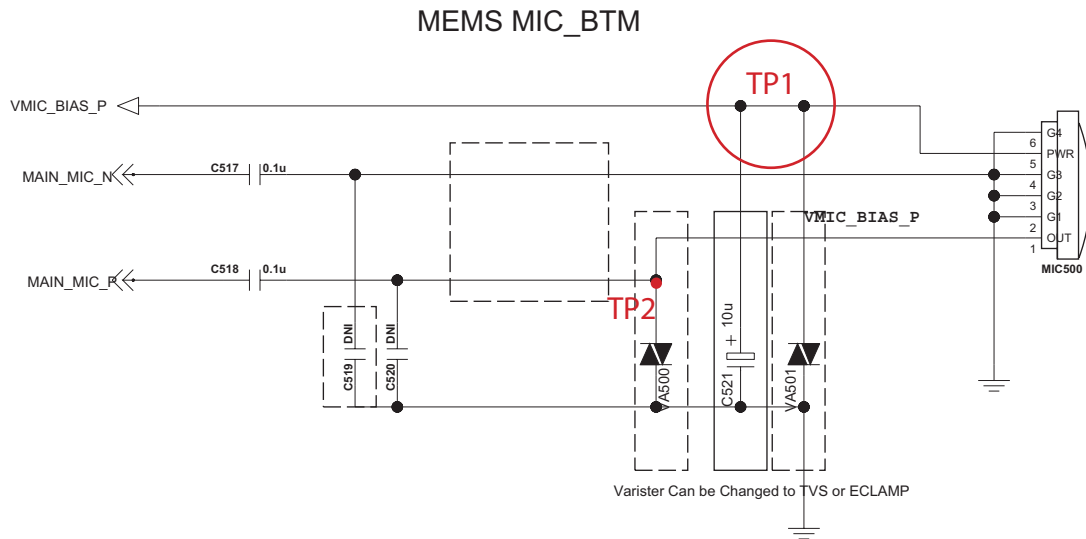


4.17 Main microphone

QSC6270 → MIC

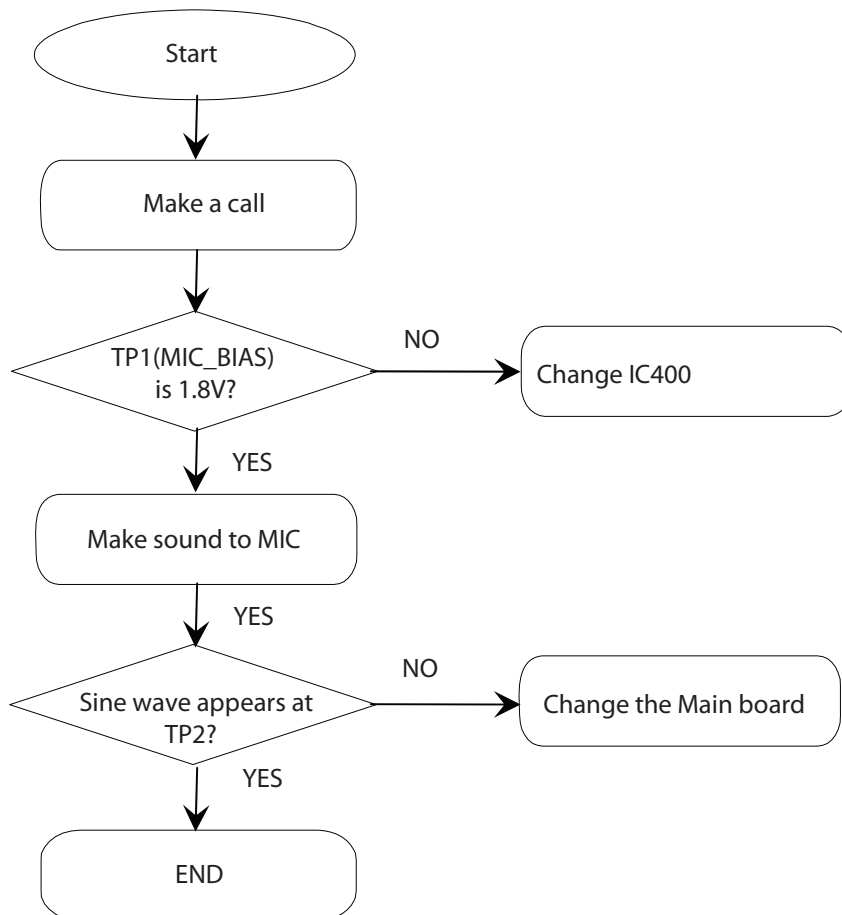


4. TROUBLE SHOOTING

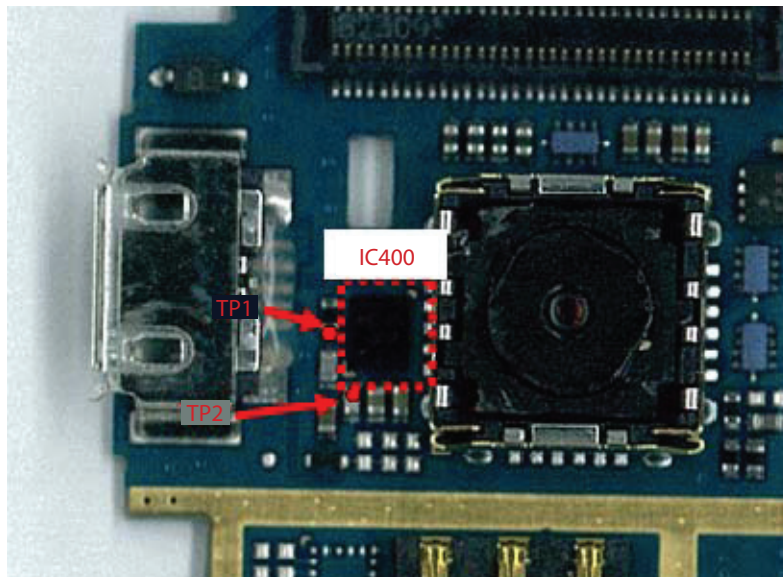
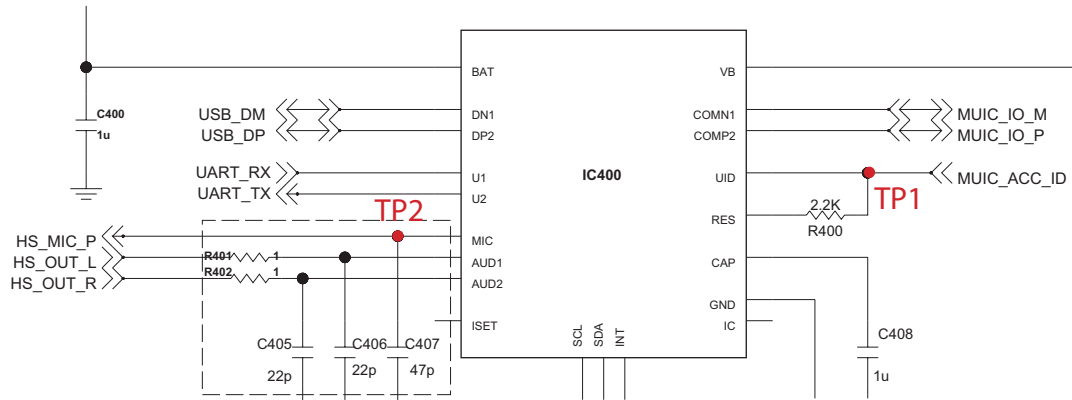


4.18 Headset microphone

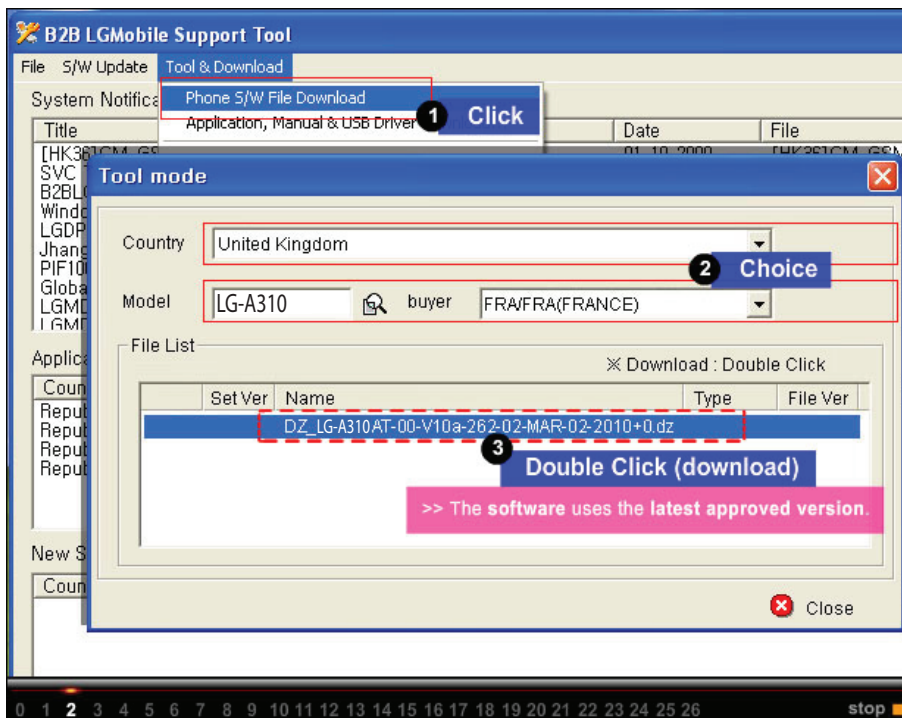
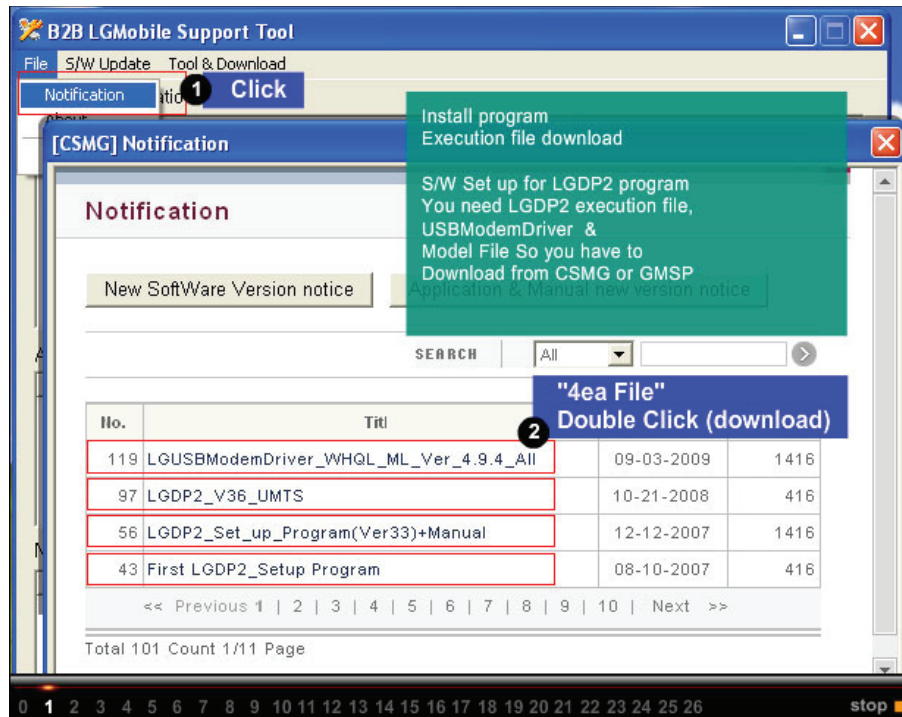
QSC6270 → IC400(MUIC) → CN400 (u USB Connector)



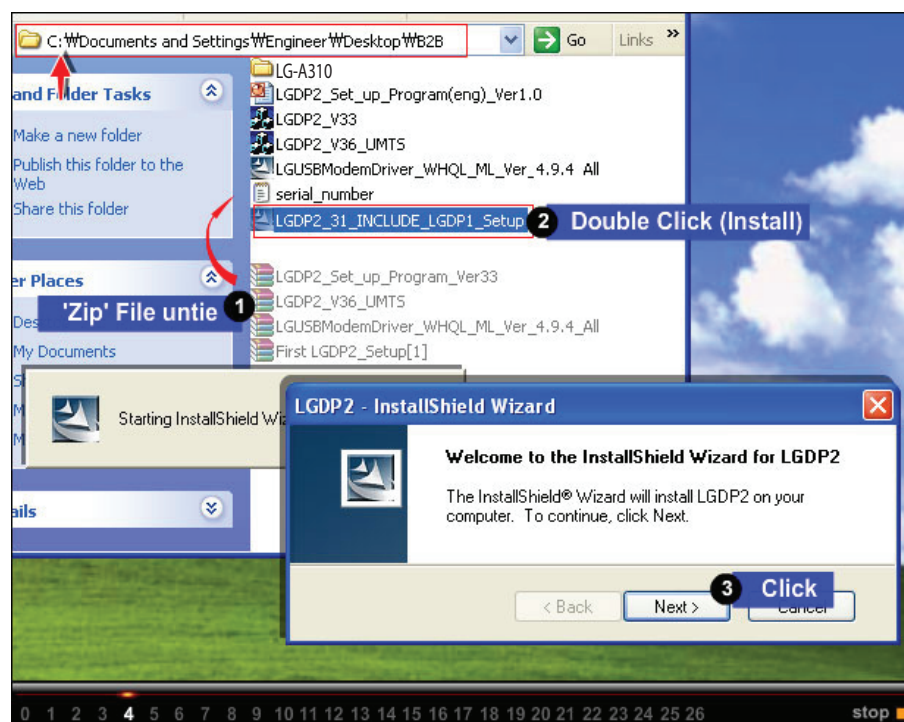
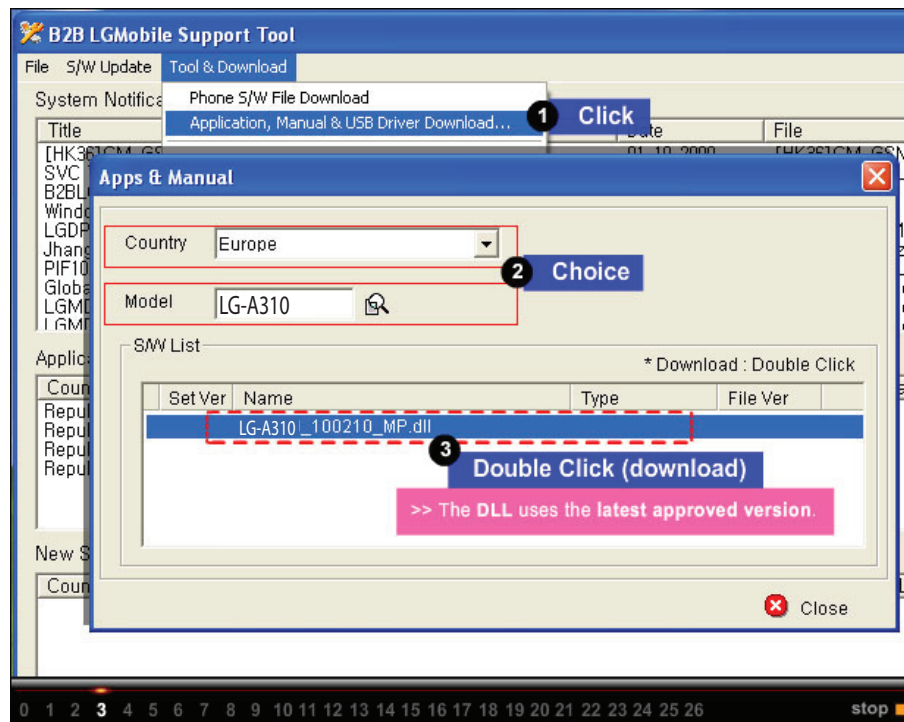
4. TROUBLE SHOOTING



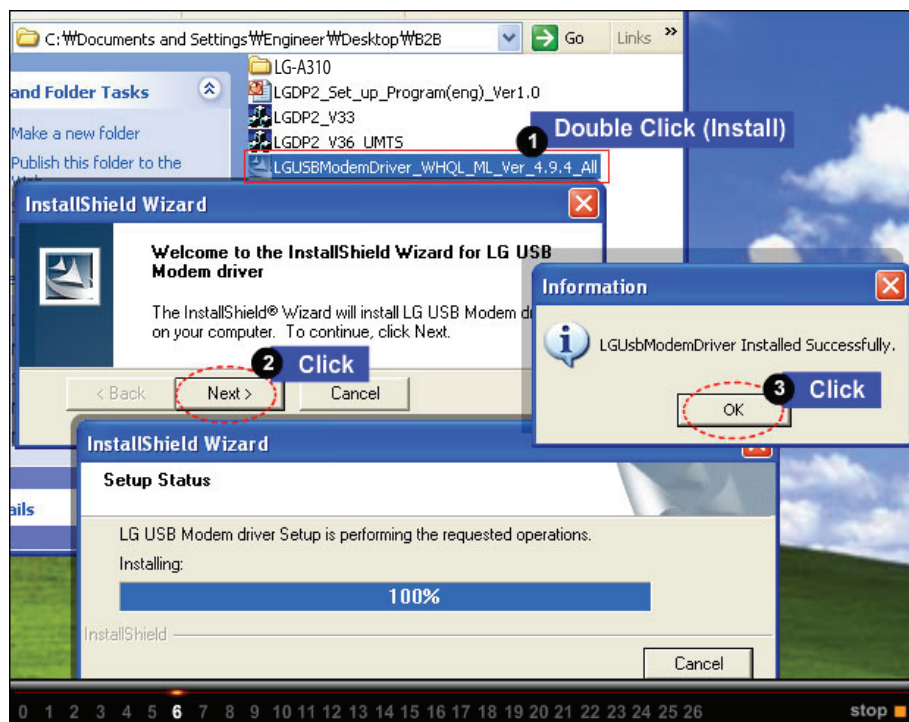
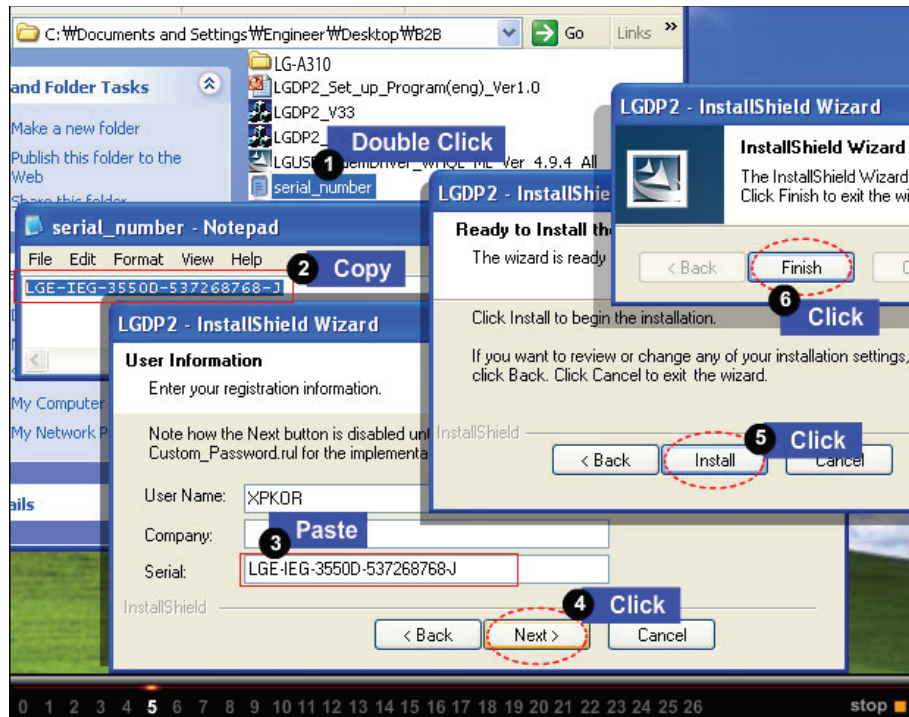
5. DOWNLOAD



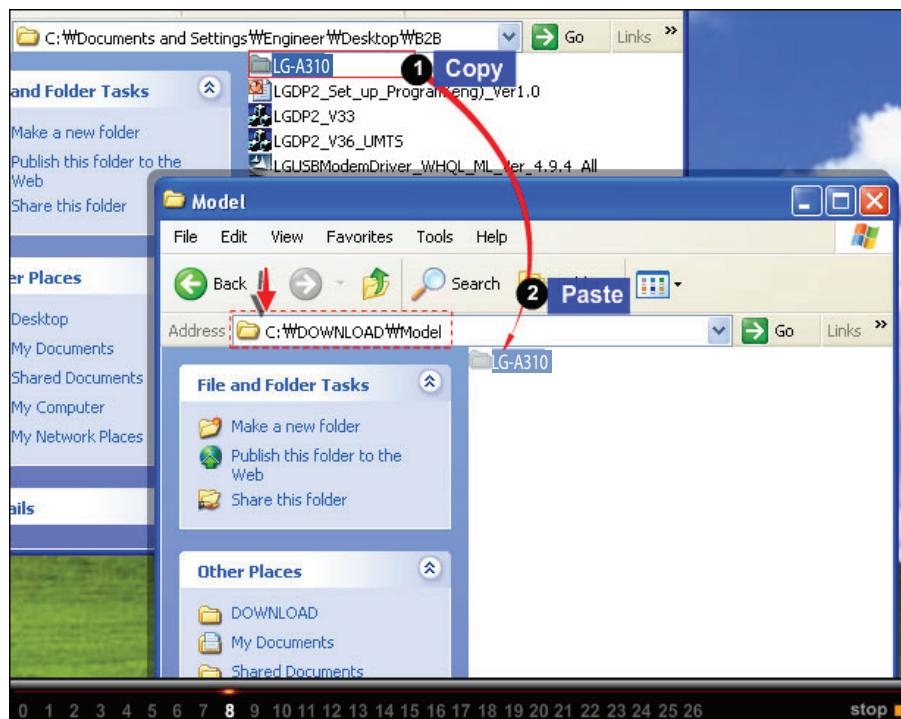
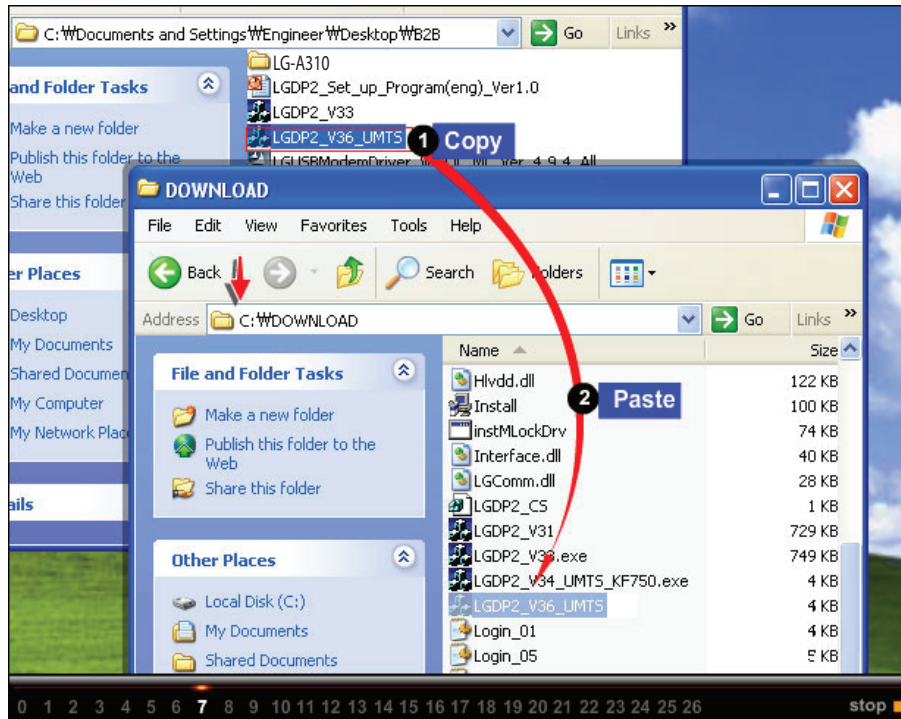
5. DOWNLOAD

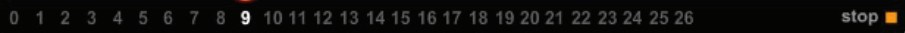


5. DOWNLOAD

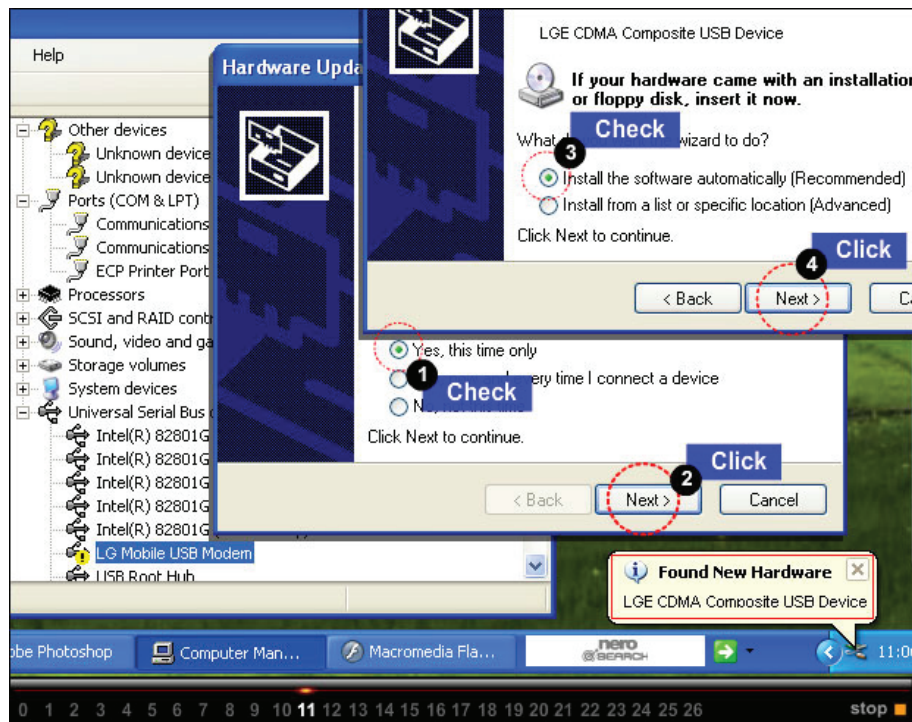


5. DOWNLOAD

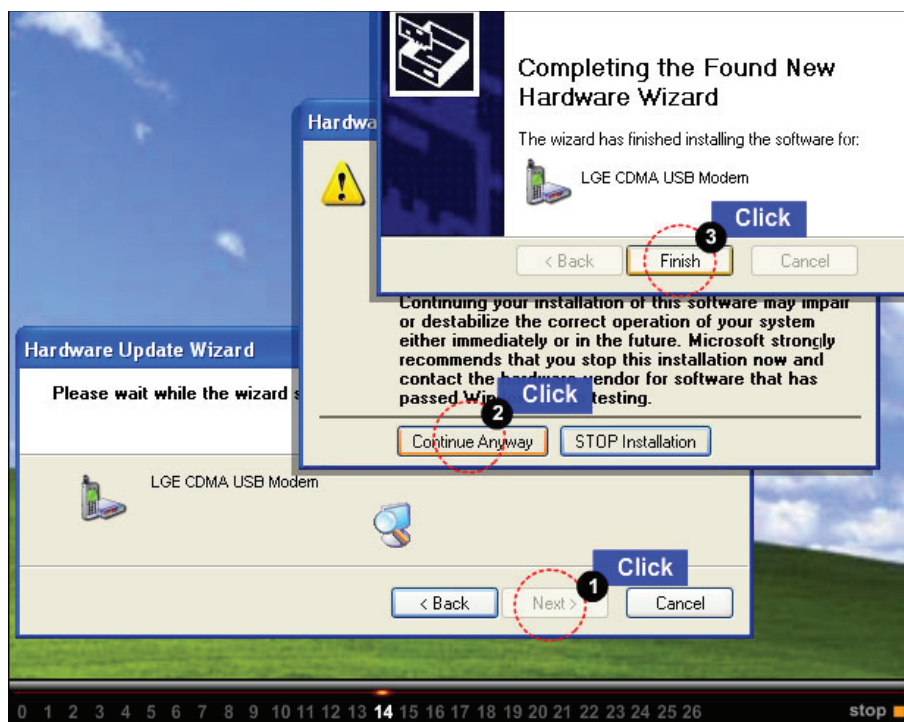
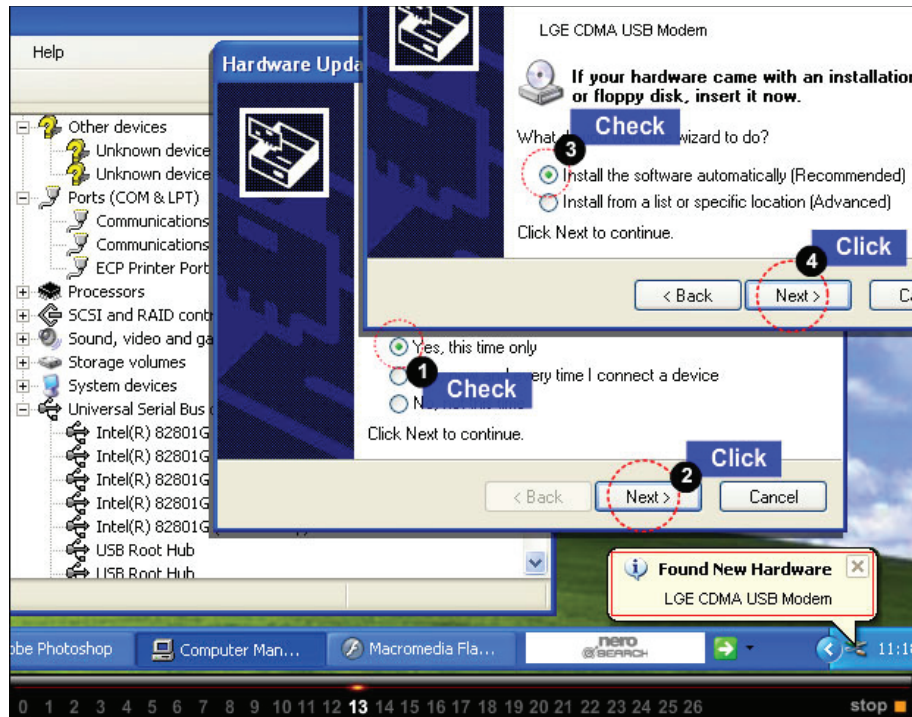




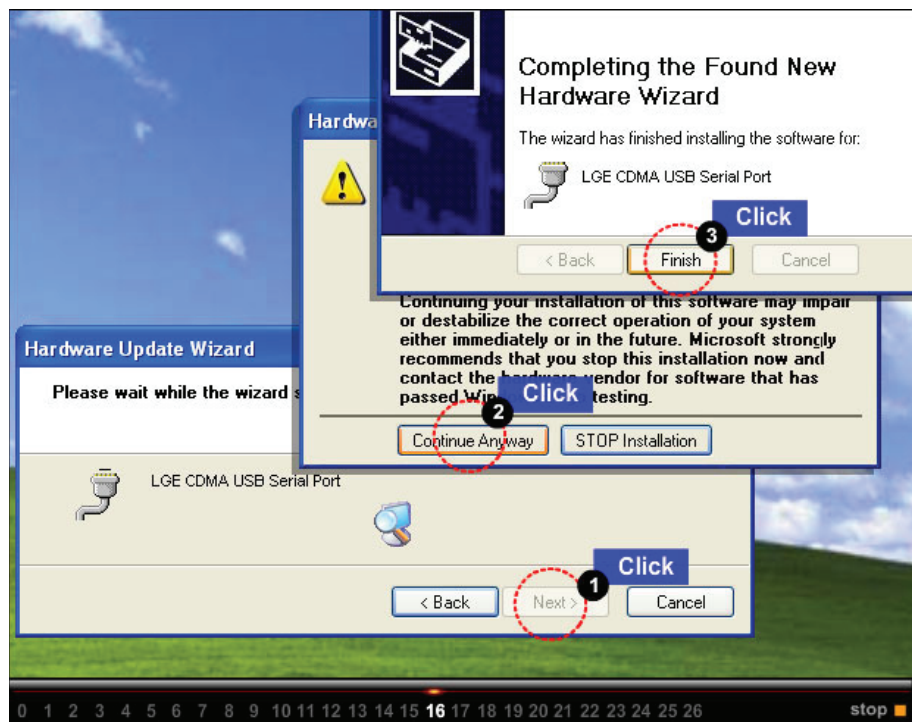
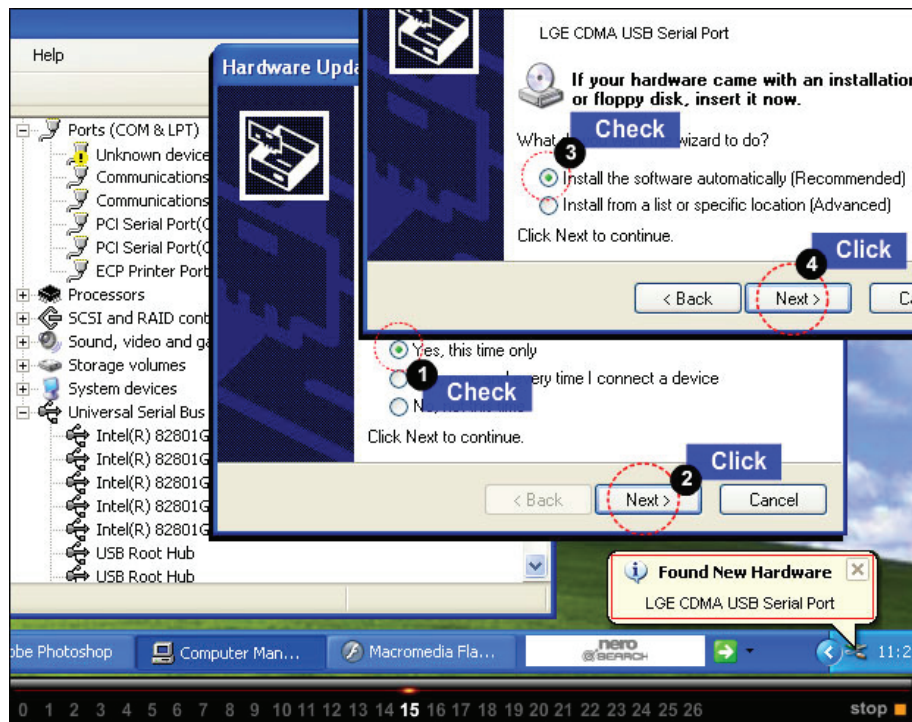
5. DOWNLOAD



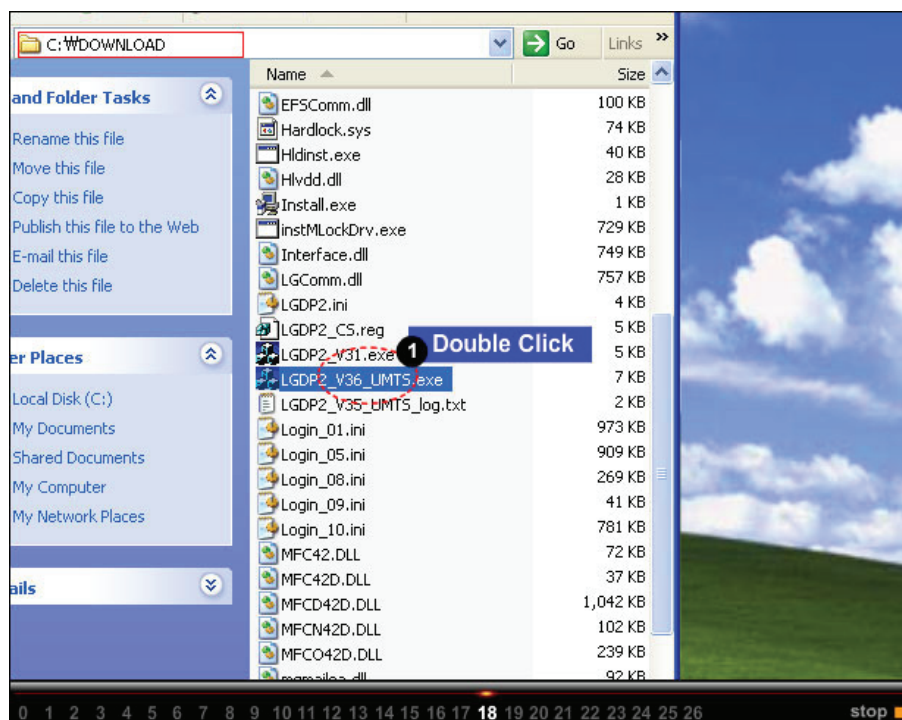
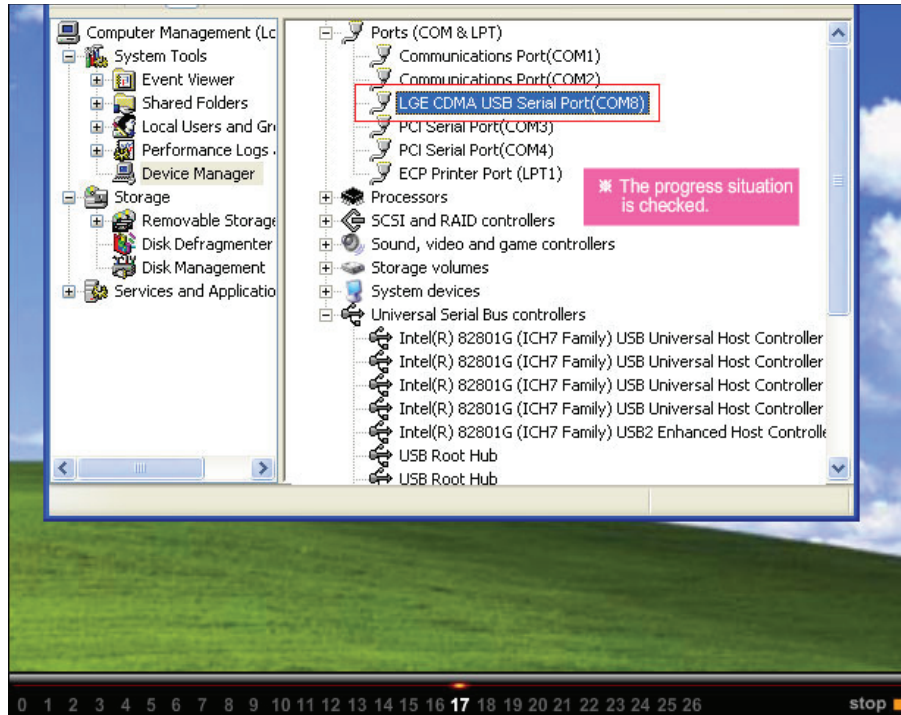
5. DOWNLOAD



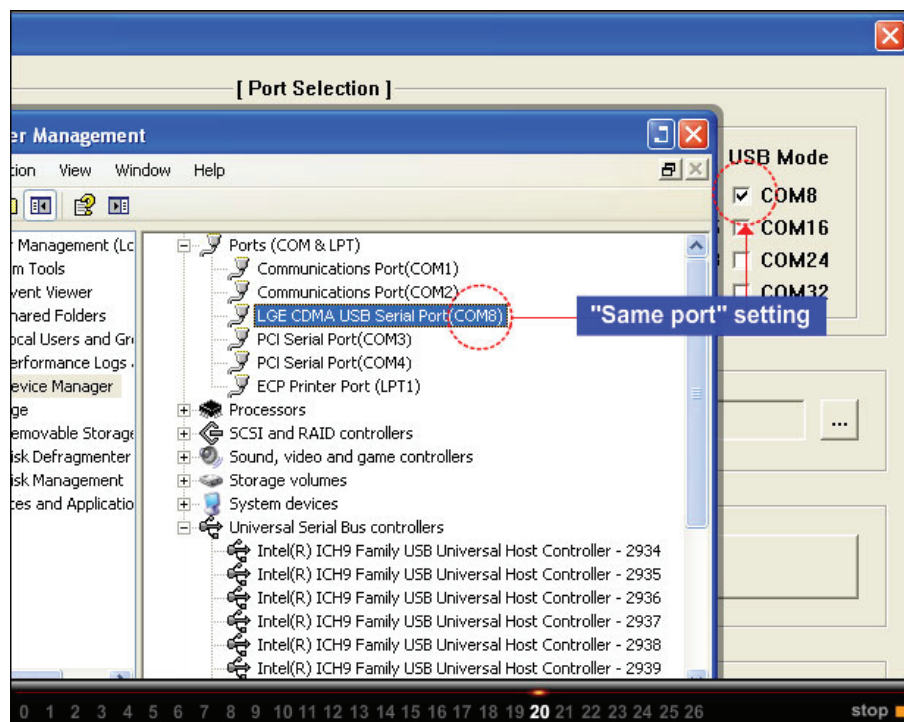
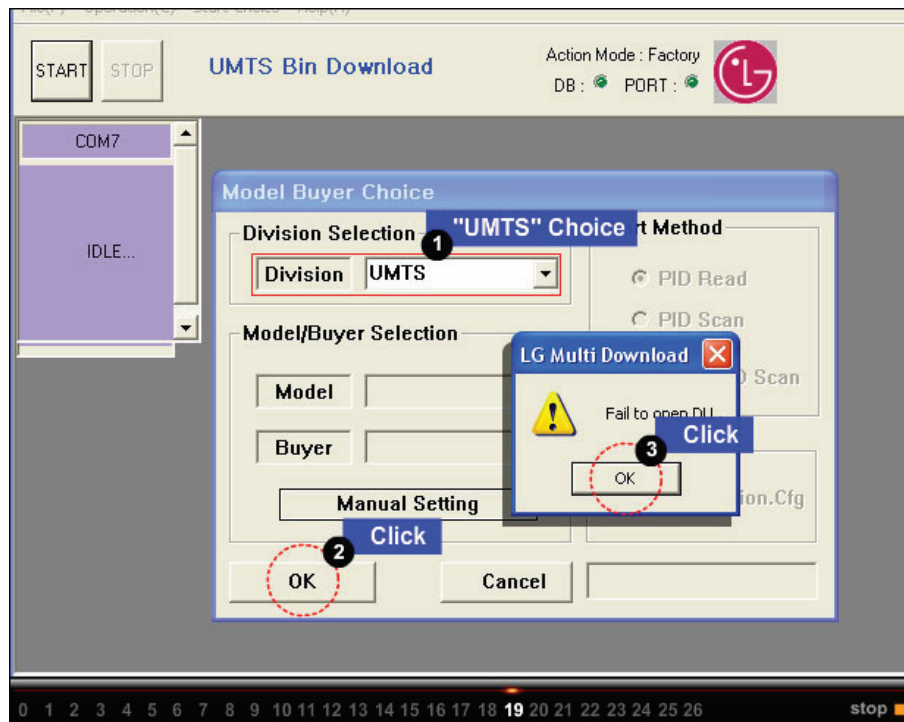
5. DOWNLOAD



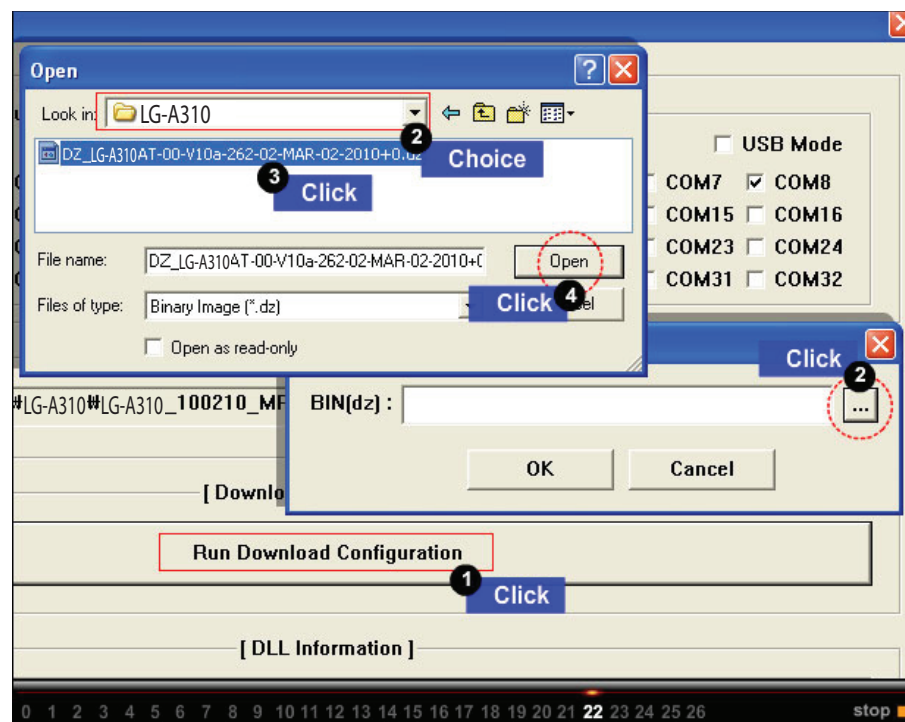
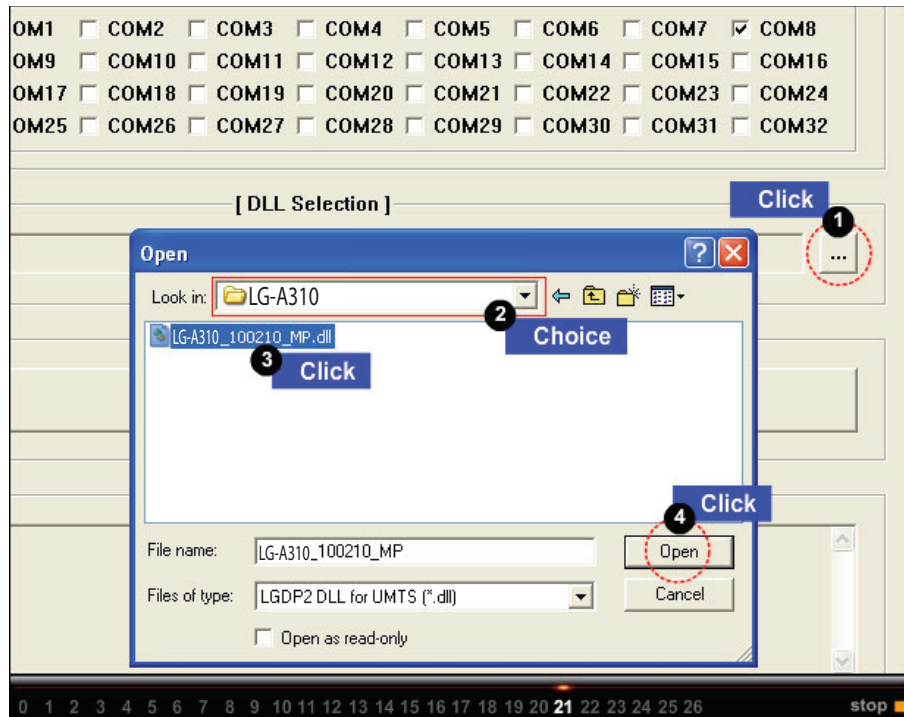
5. DOWNLOAD



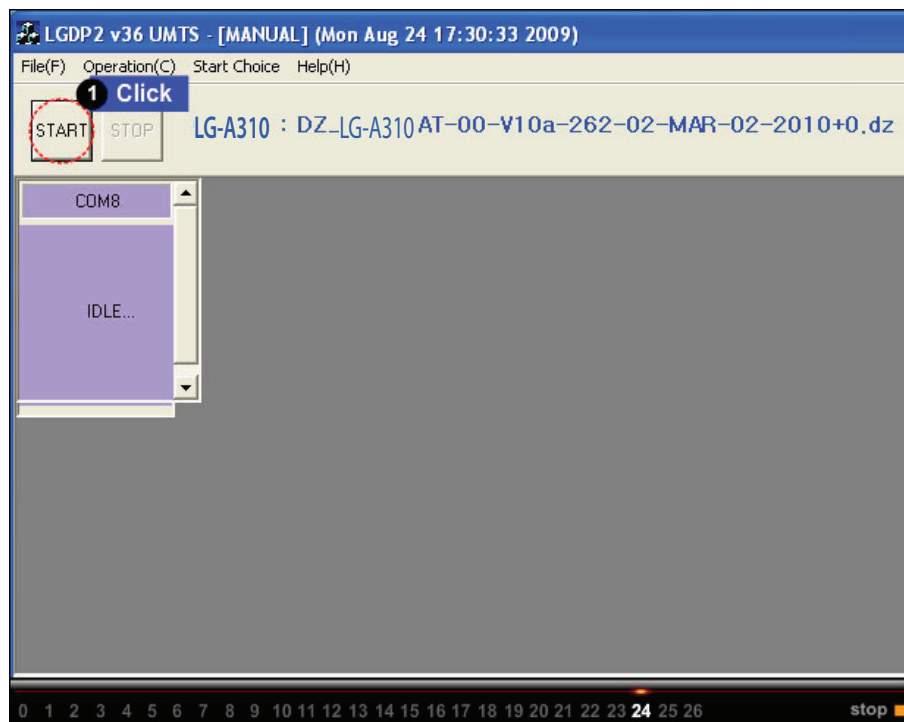
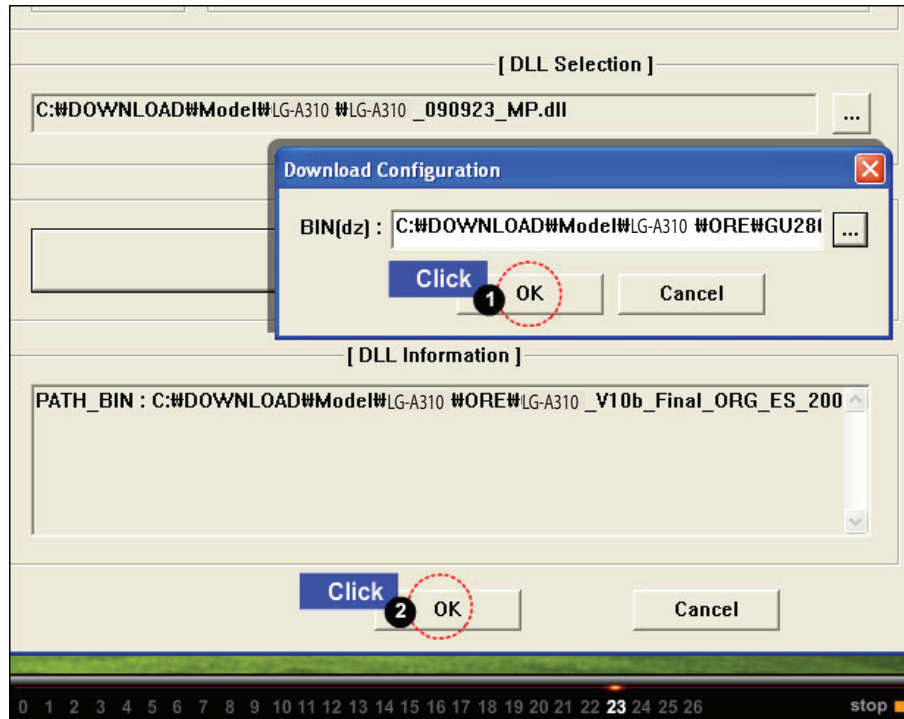
5. DOWNLOAD



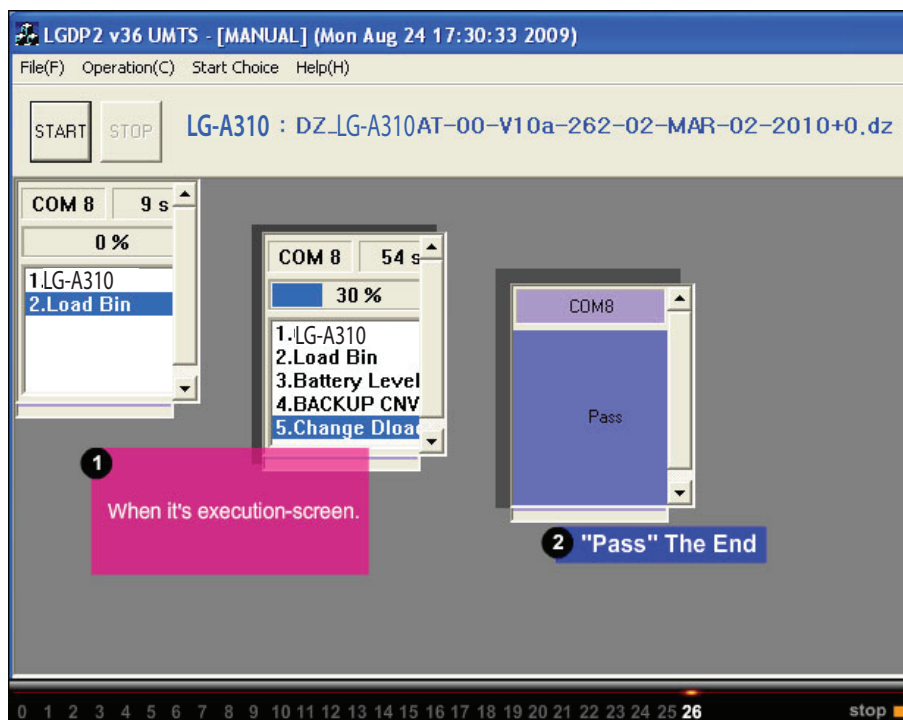
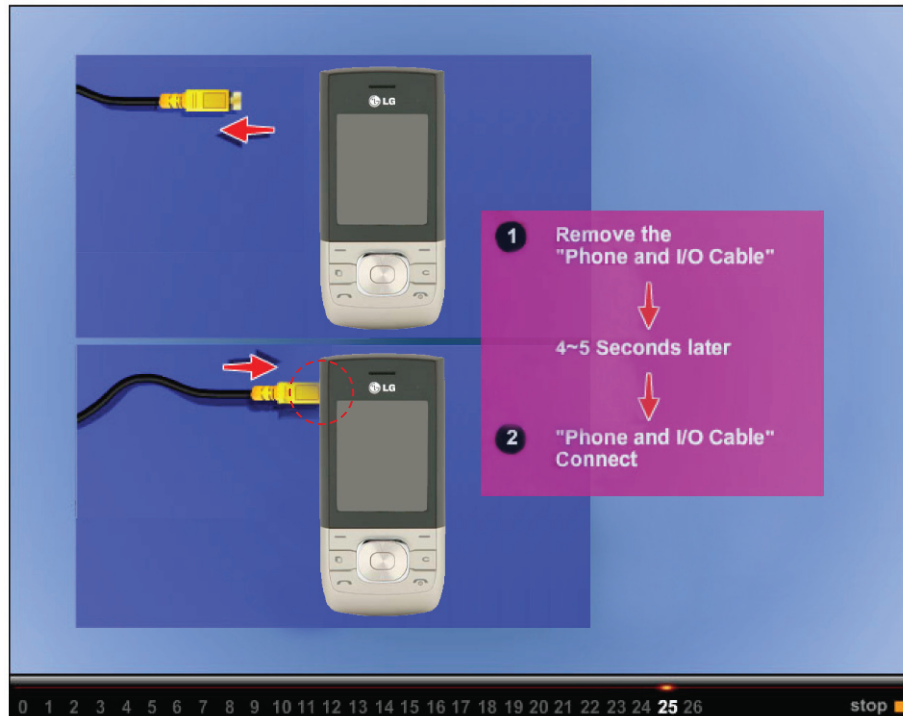
5. DOWNLOAD



5. DOWNLOAD

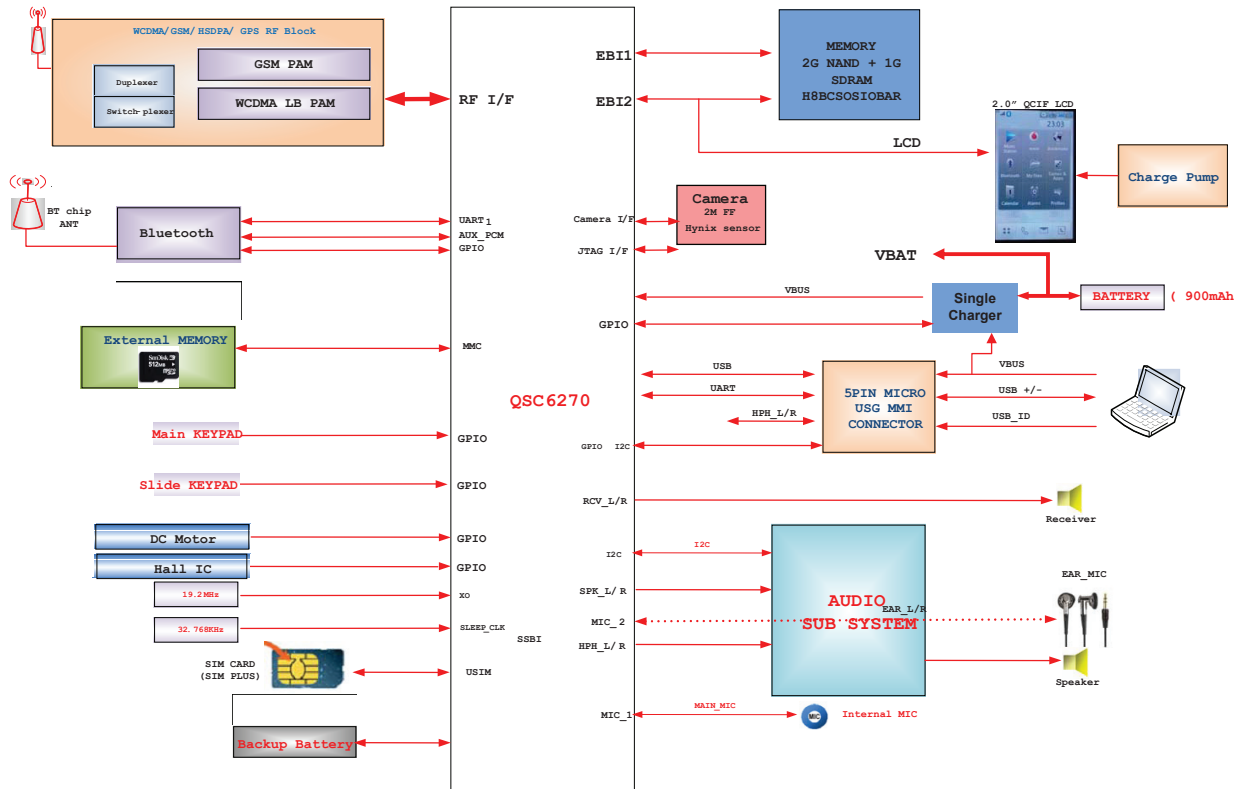


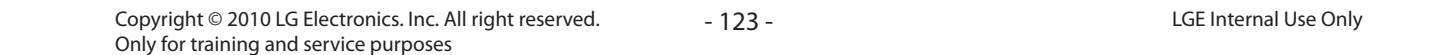
5. DOWNLOAD



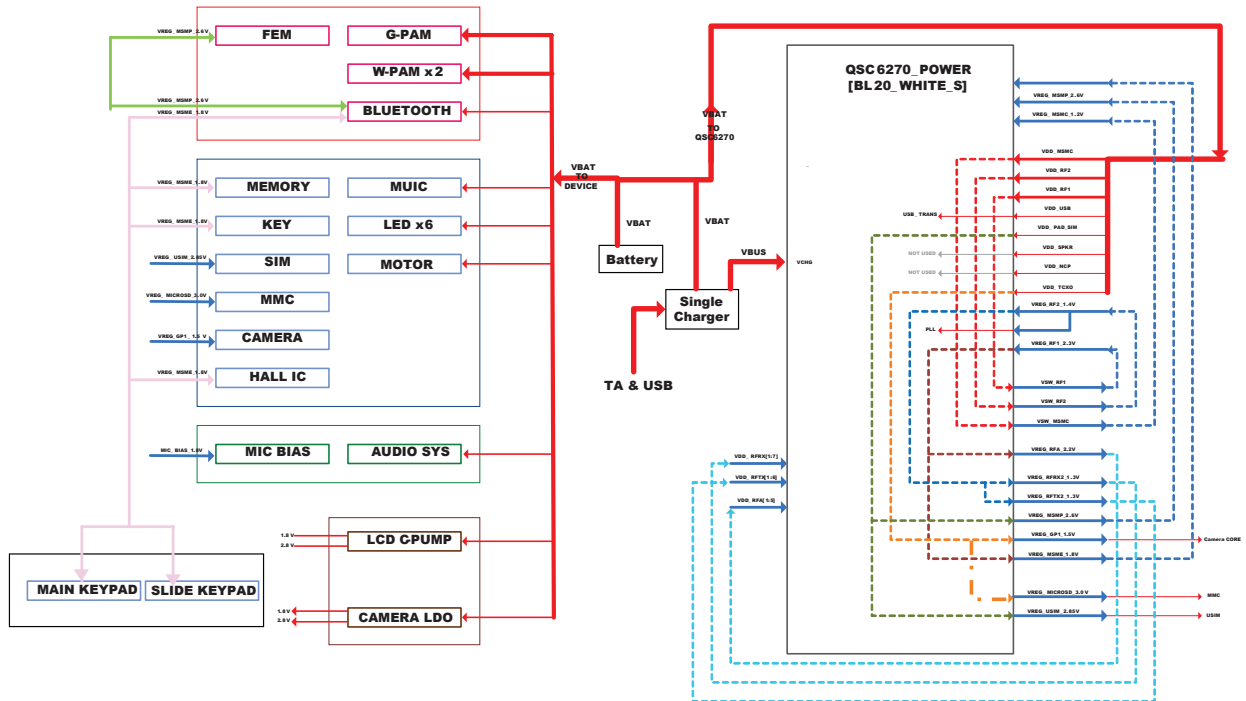
6. BLOCK DIAGRAM

6. BLOCK DIAGRAM

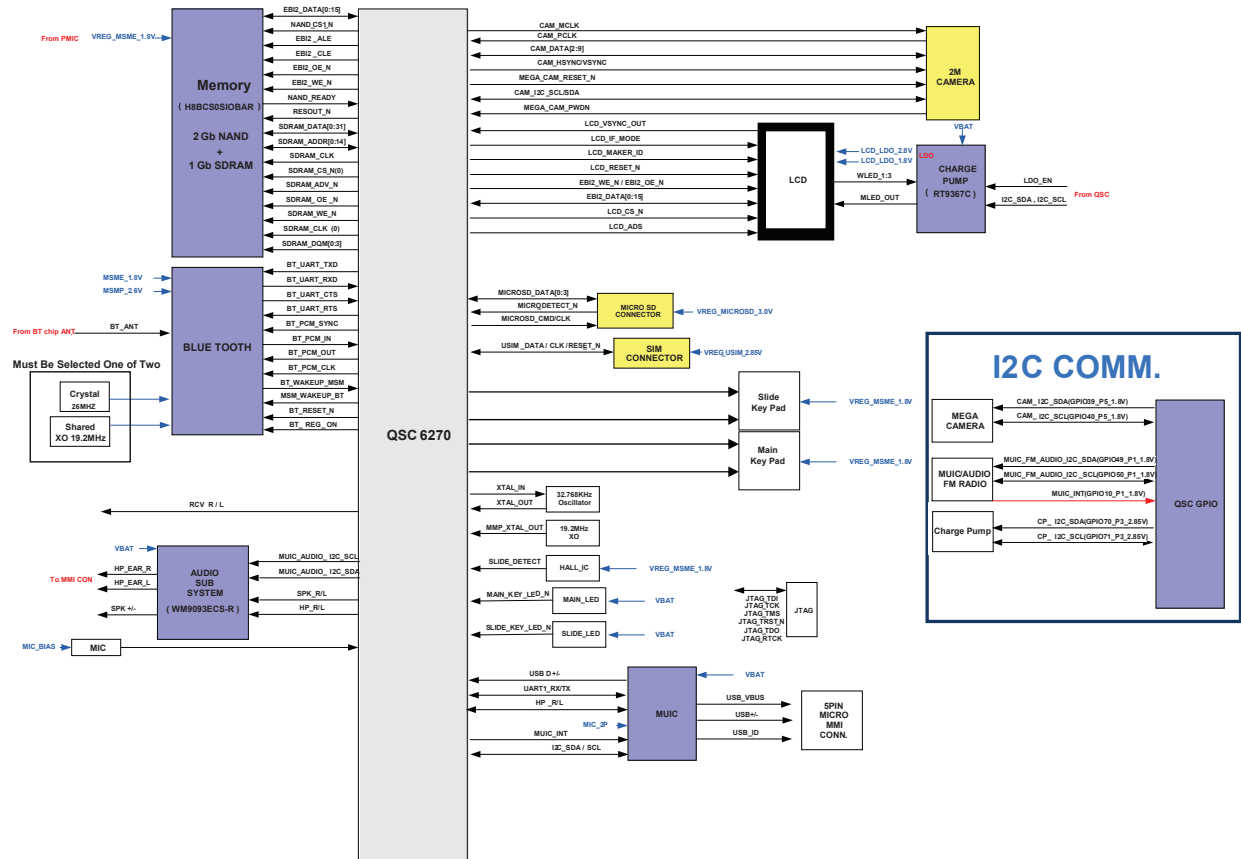


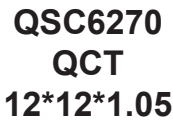


6. BLOCK DIAGRAM

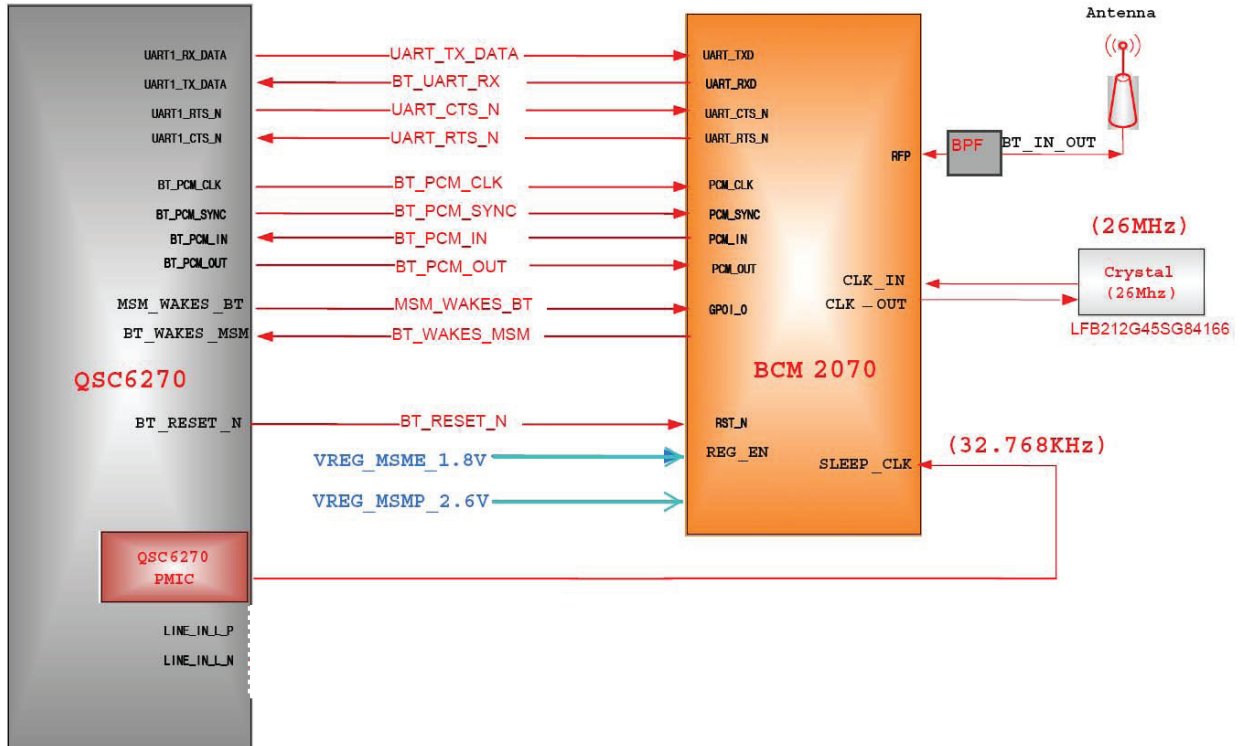


6. BLOCK DIAGRAM

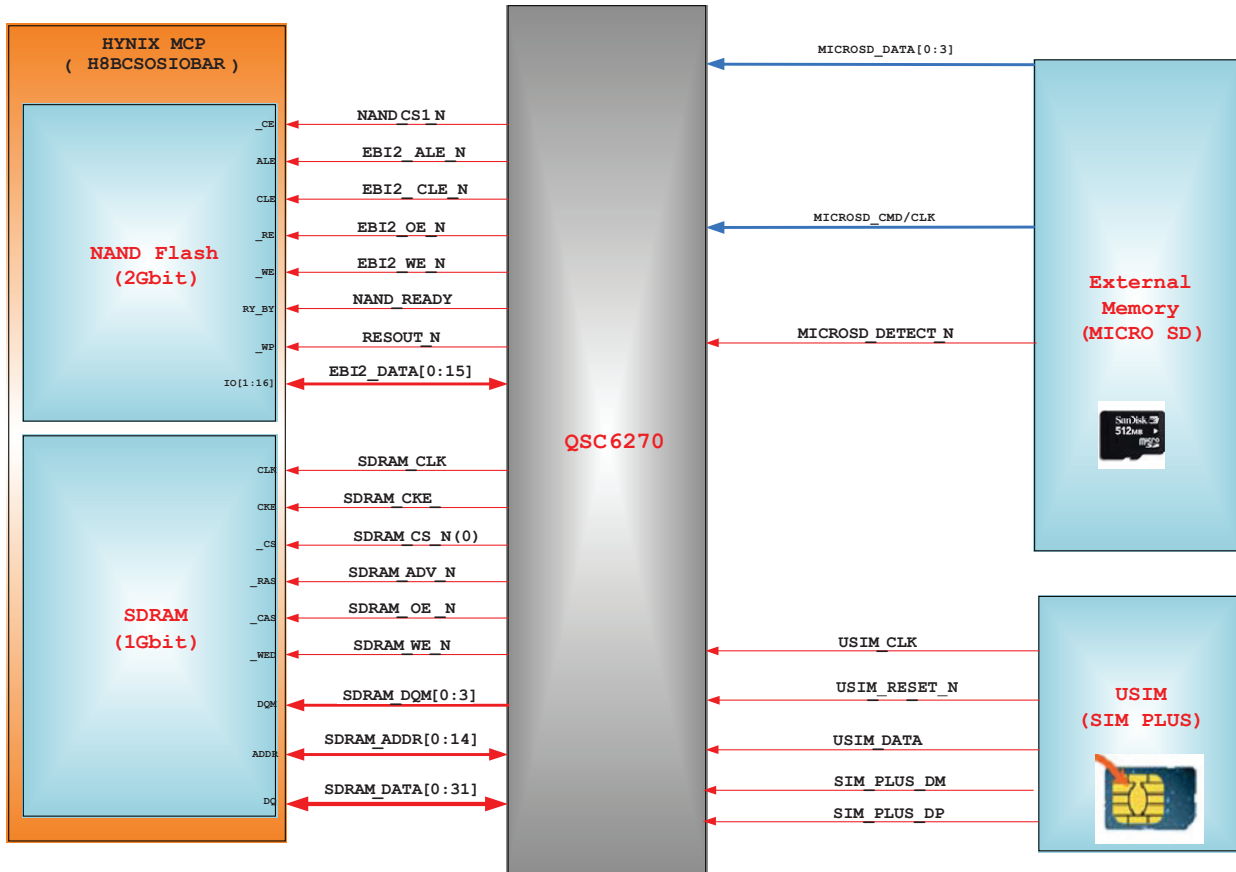




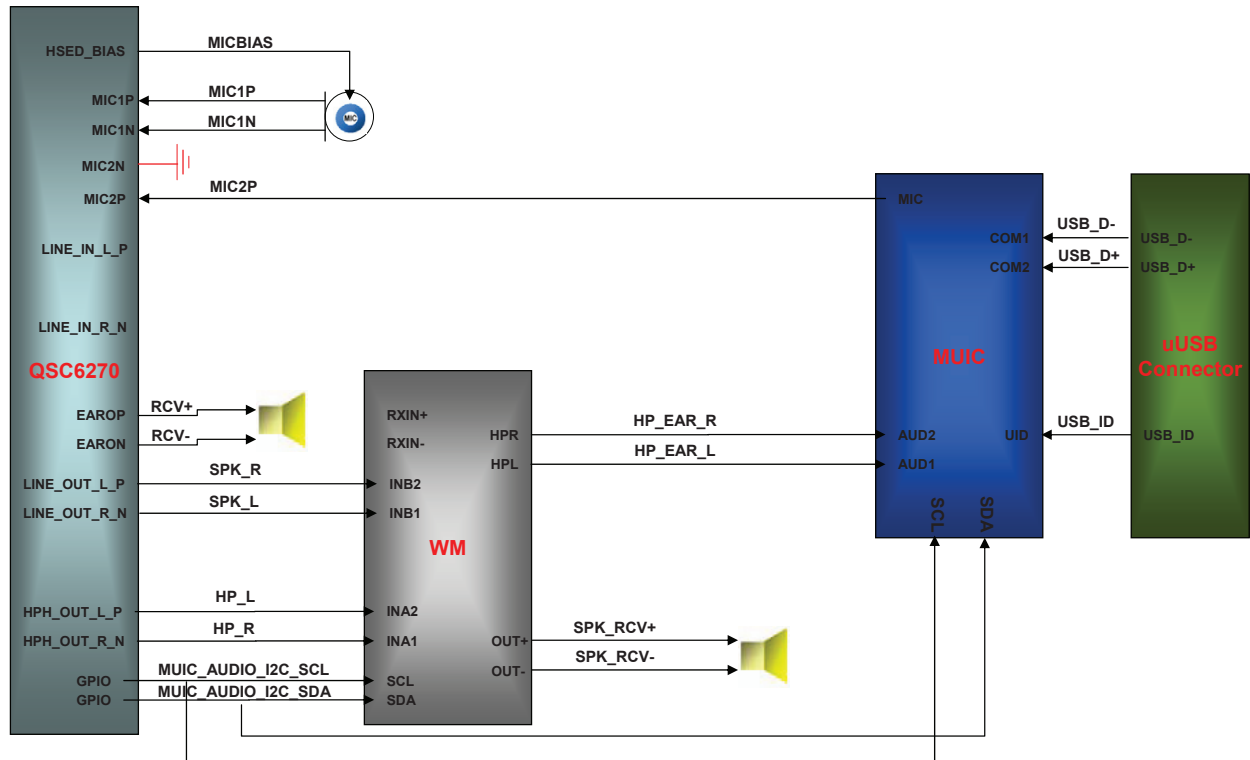
6. BLOCK DIAGRAM



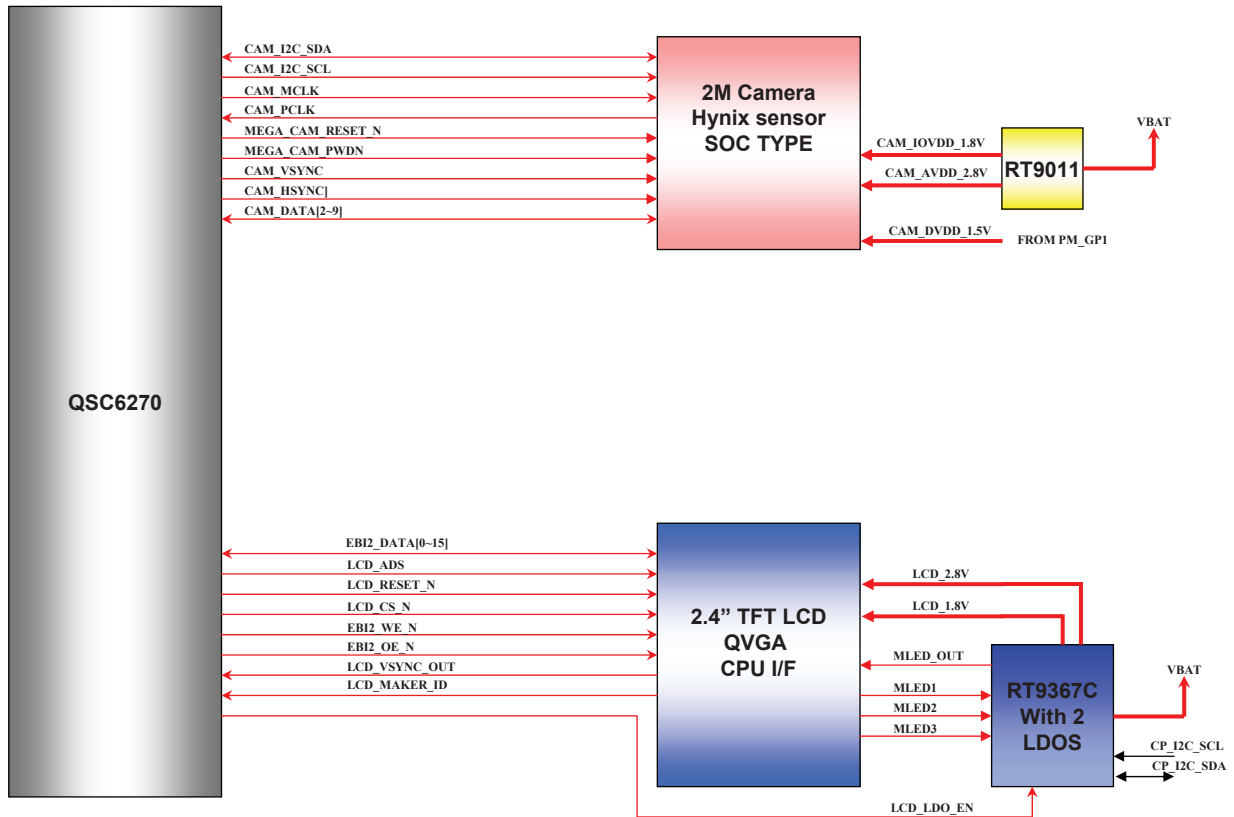
6. BLOCK DIAGRAM



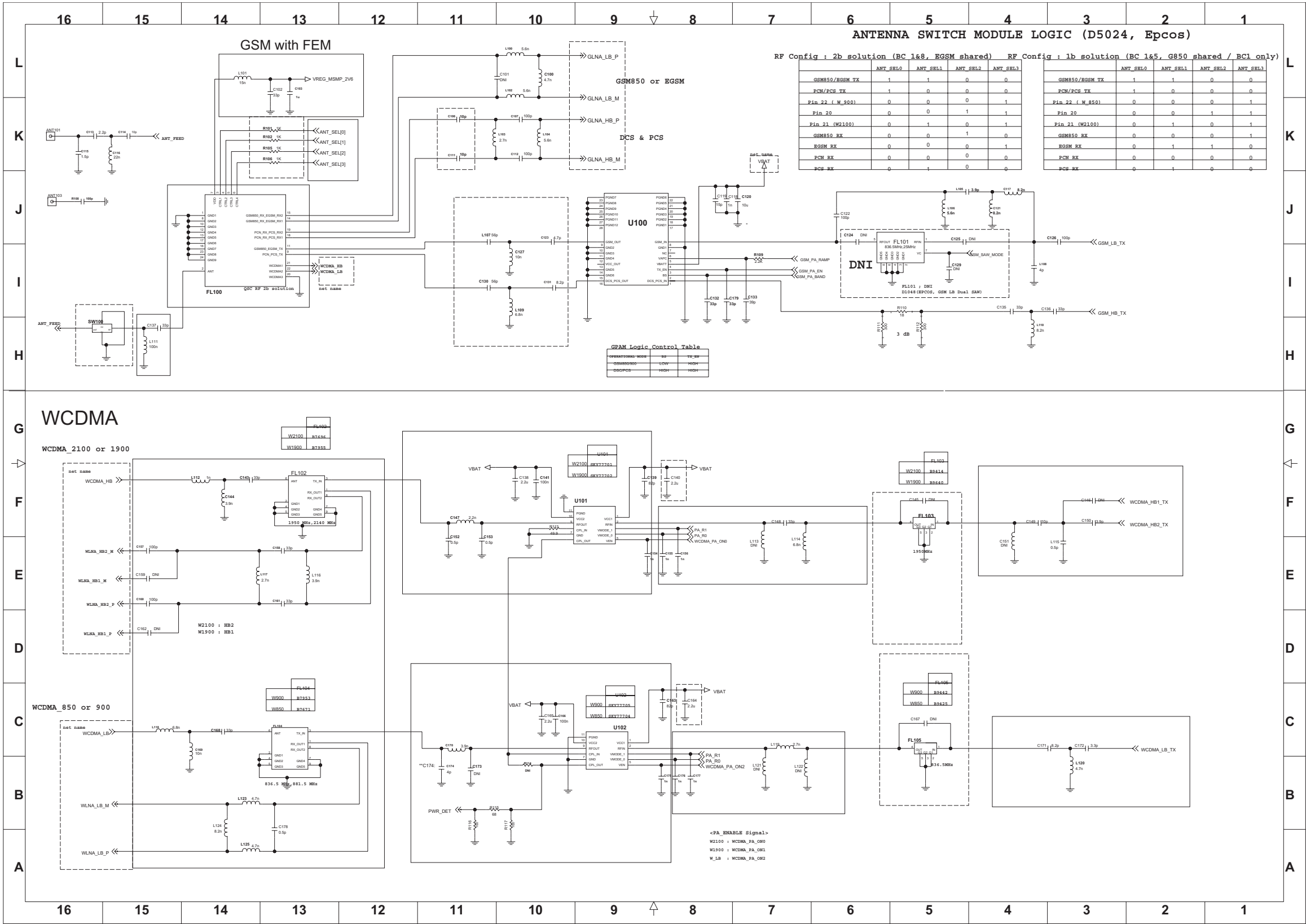
6. BLOCK DIAGRAM



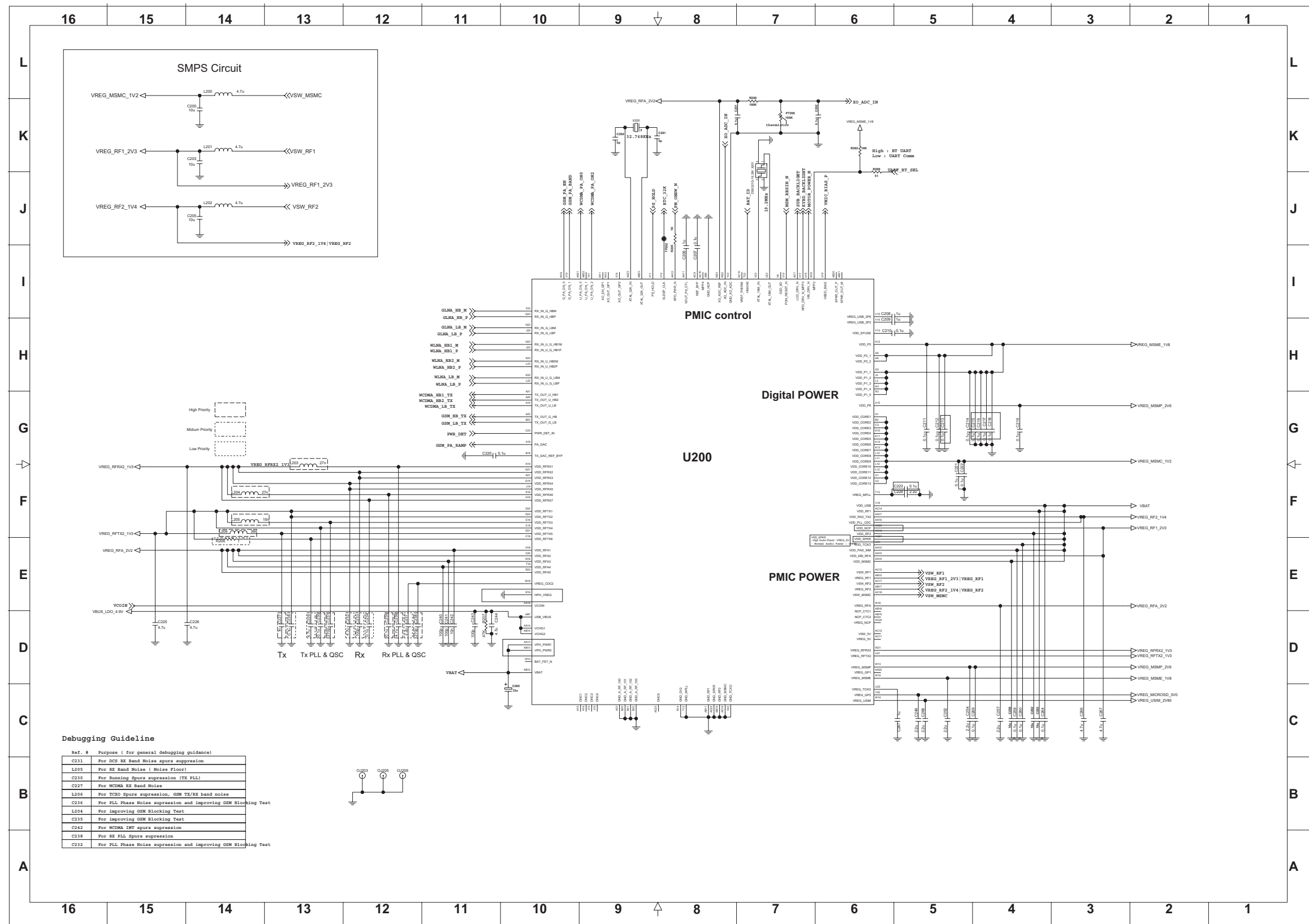
6. BLOCK DIAGRAM



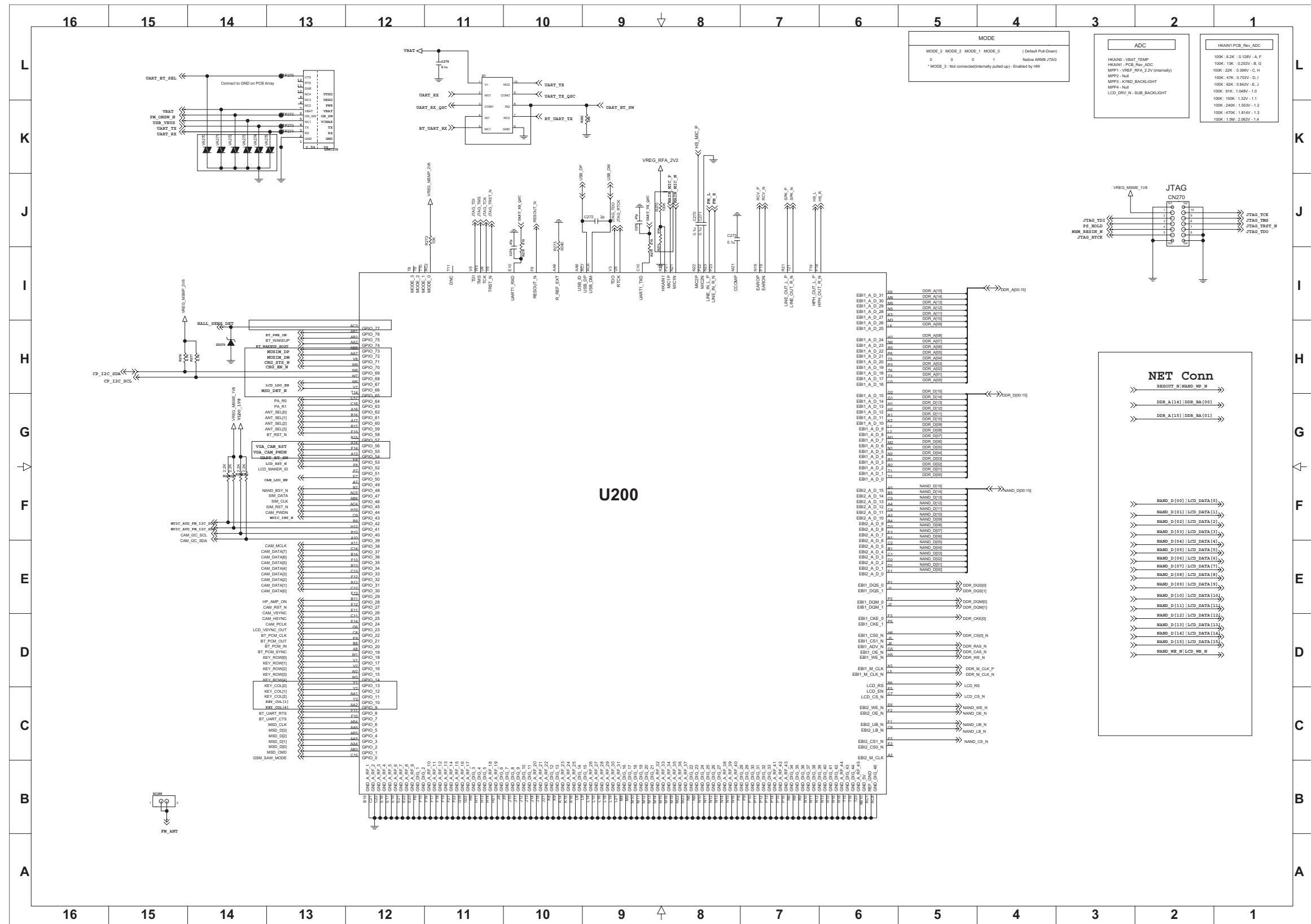
7. CIRCUIT DIAGRAM



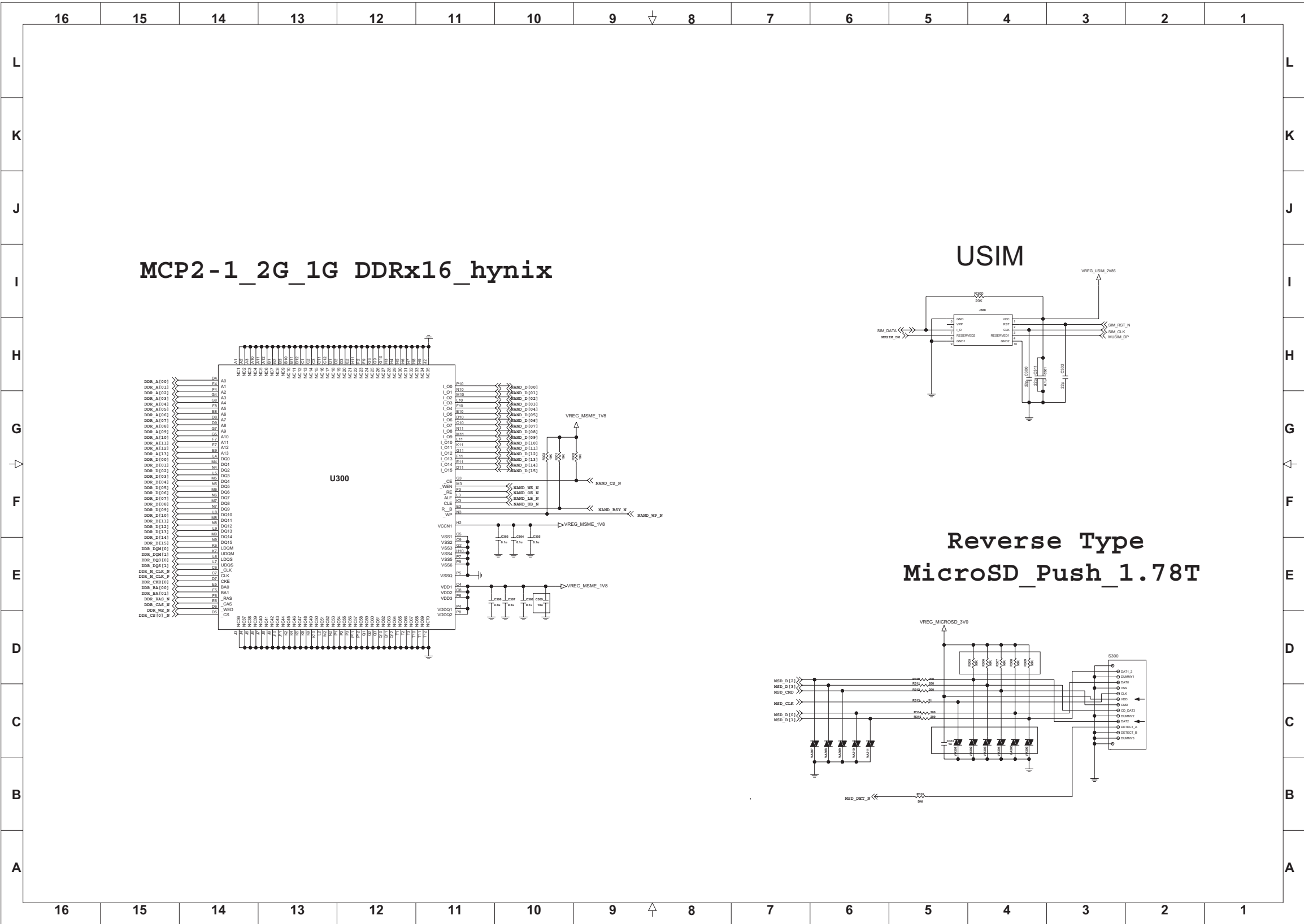
7. CIRCUIT DIAGRAM



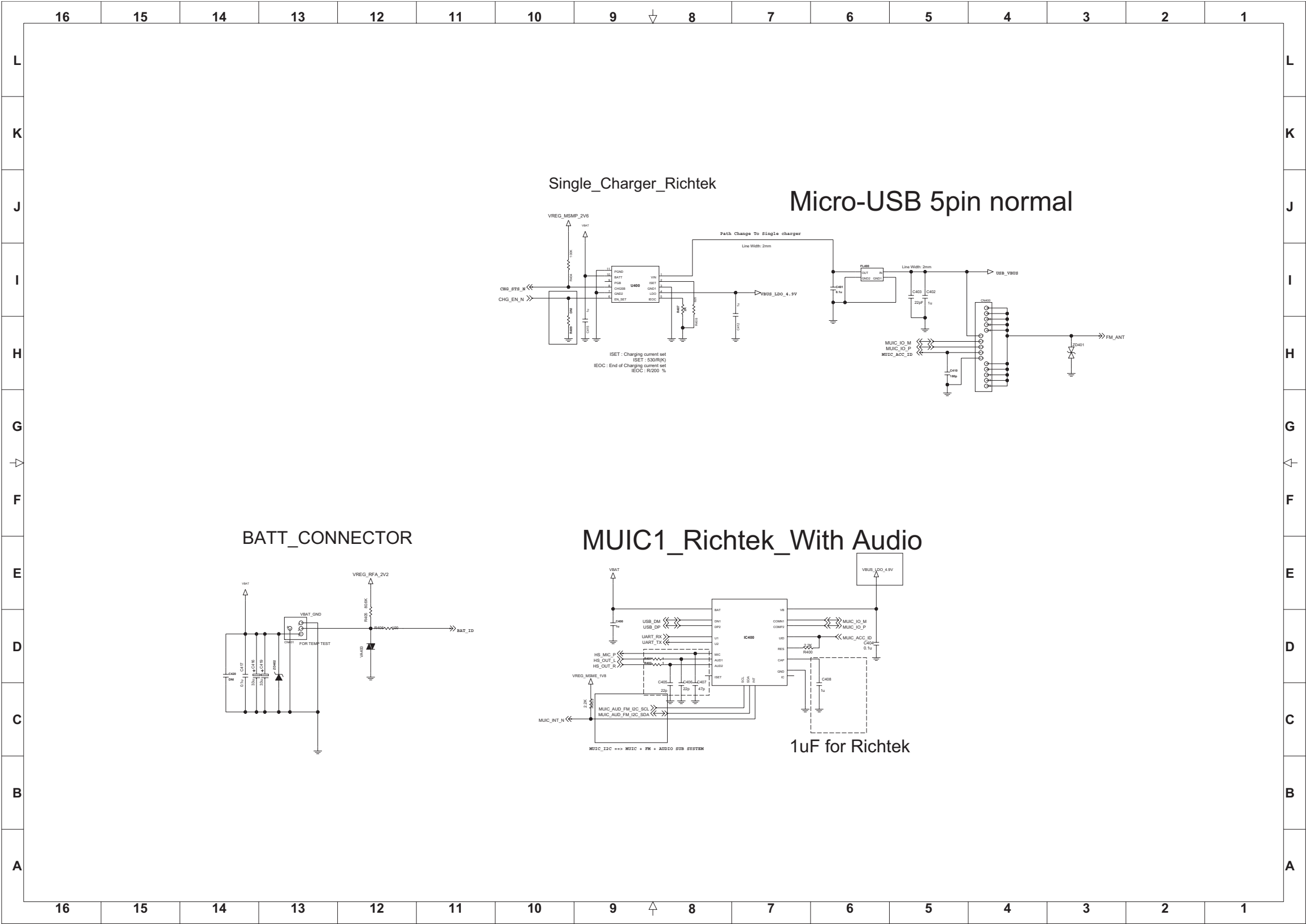
7. CIRCUIT DIAGRAM



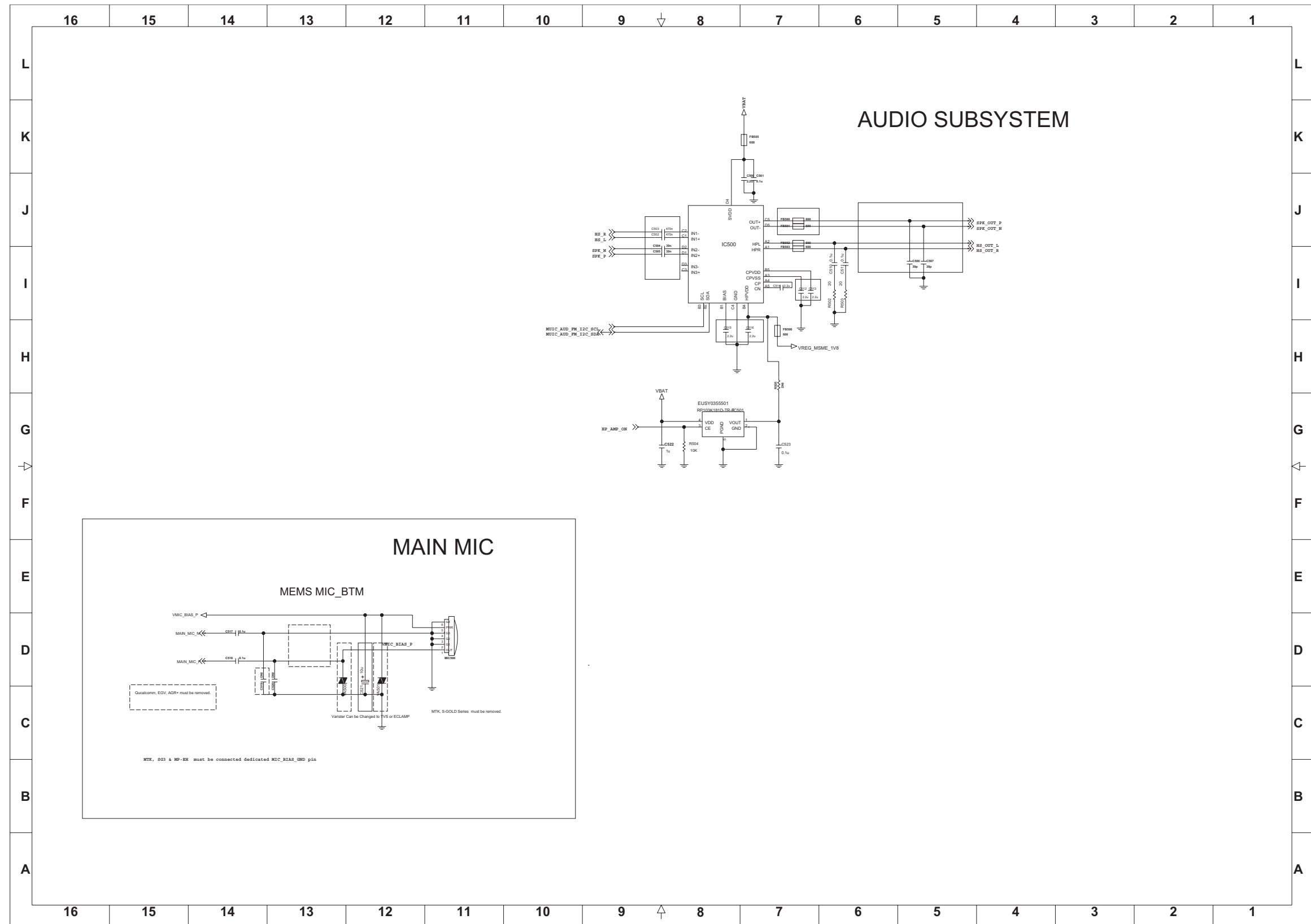
7. CIRCUIT DIAGRAM



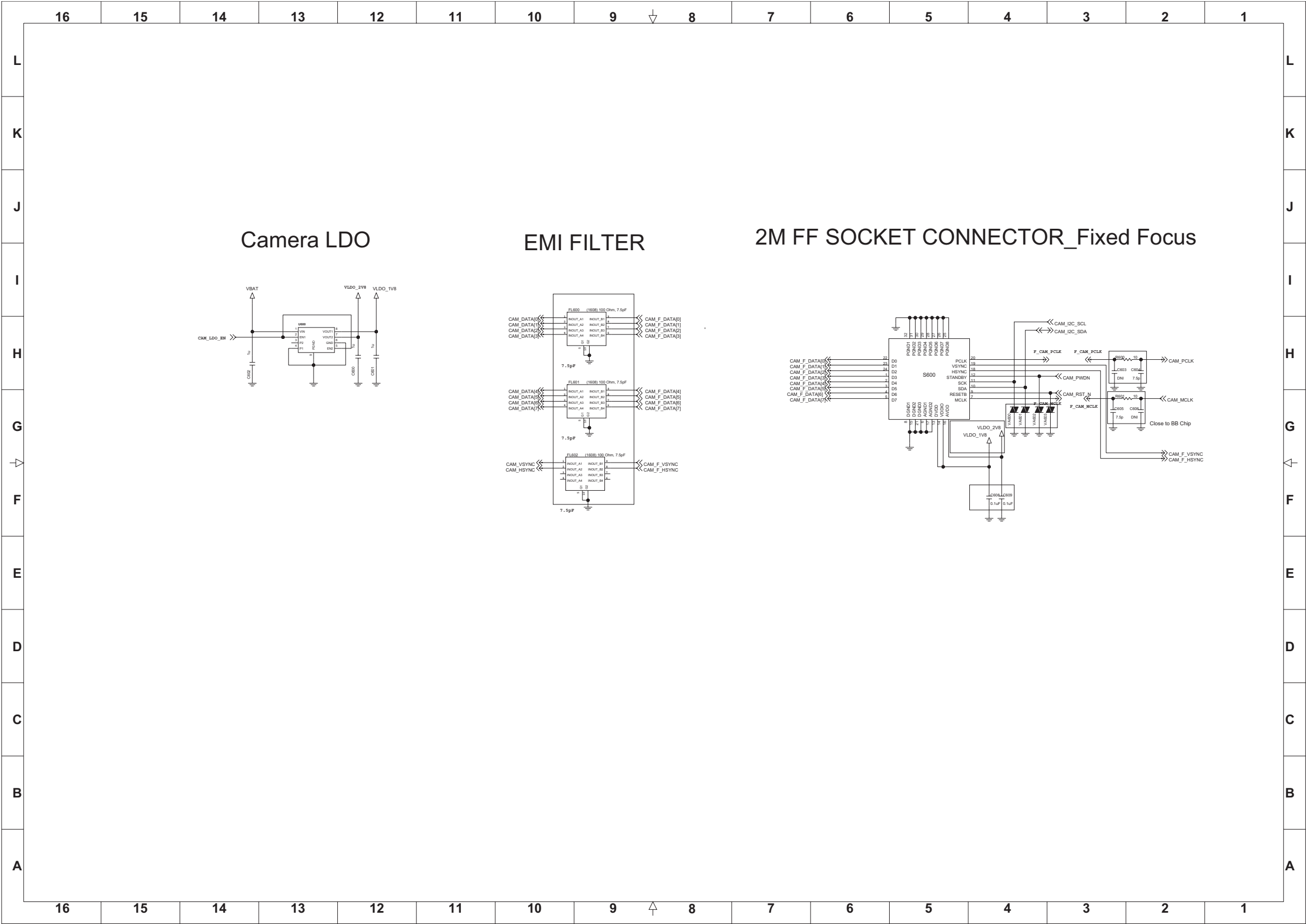
7. CIRCUIT DIAGRAM



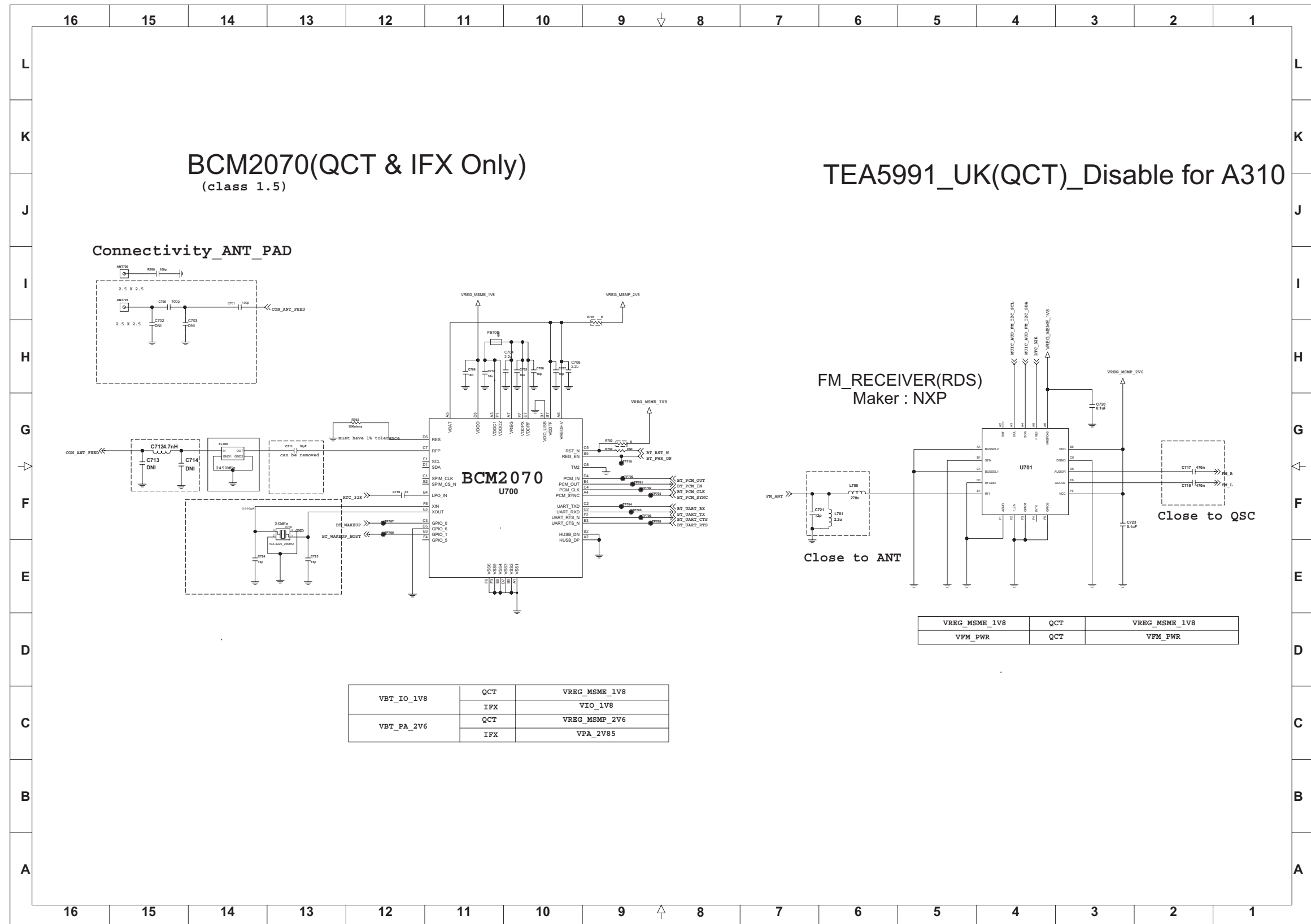
7. CIRCUIT DIAGRAM



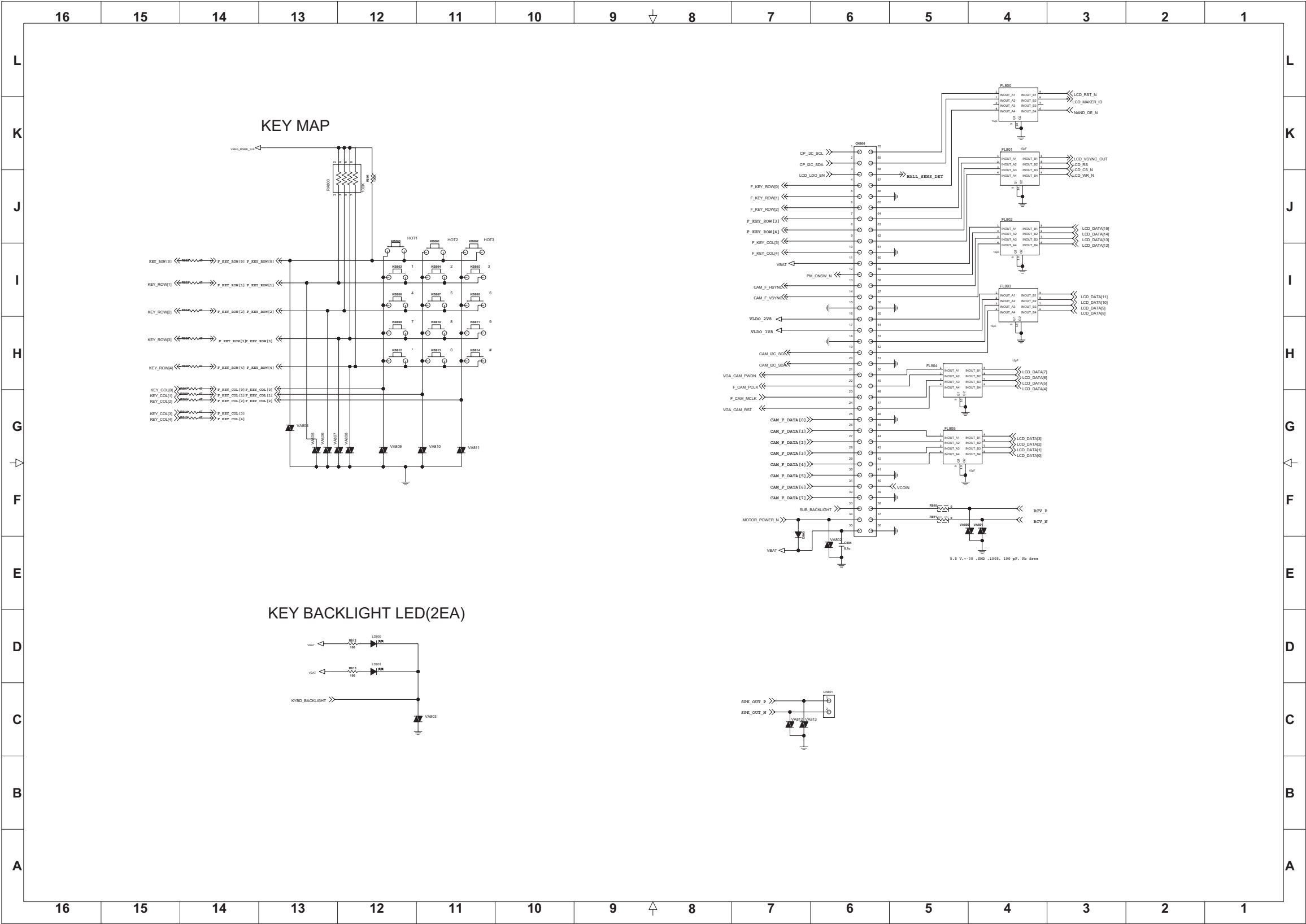
7. CIRCUIT DIAGRAM



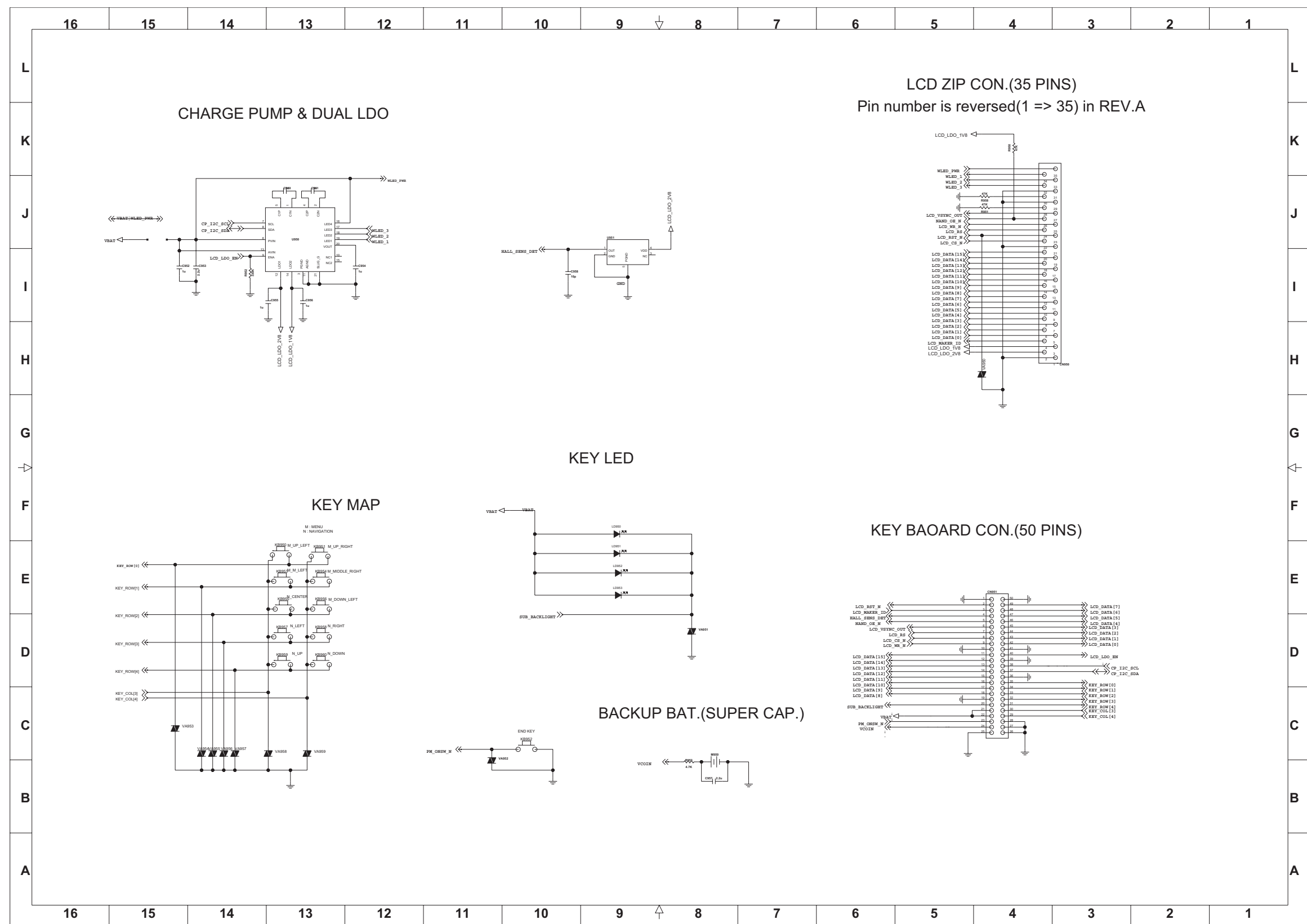
7. CIRCUIT DIAGRAM



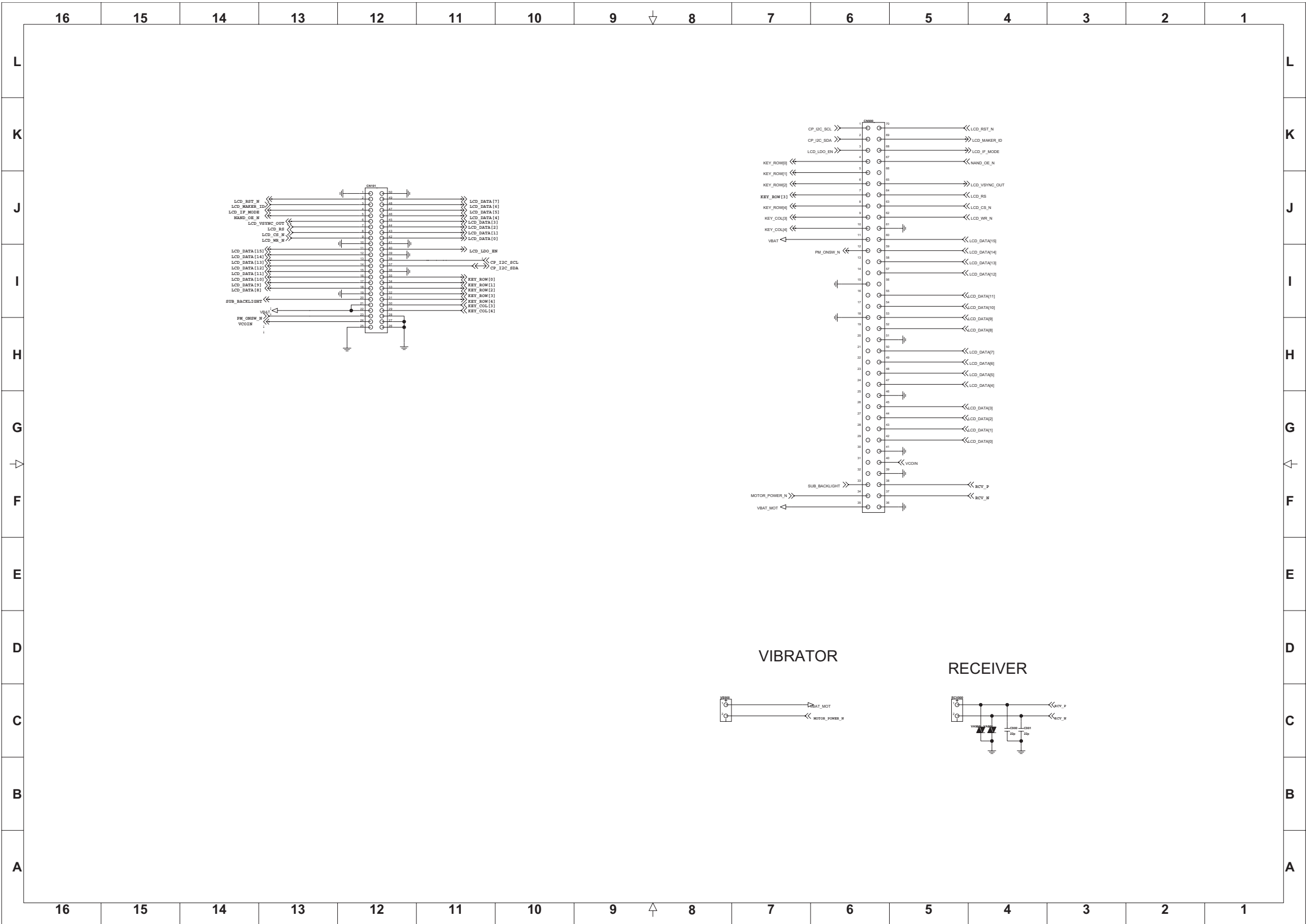
7. CIRCUIT DIAGRAM



7. CIRCUIT DIAGRAM

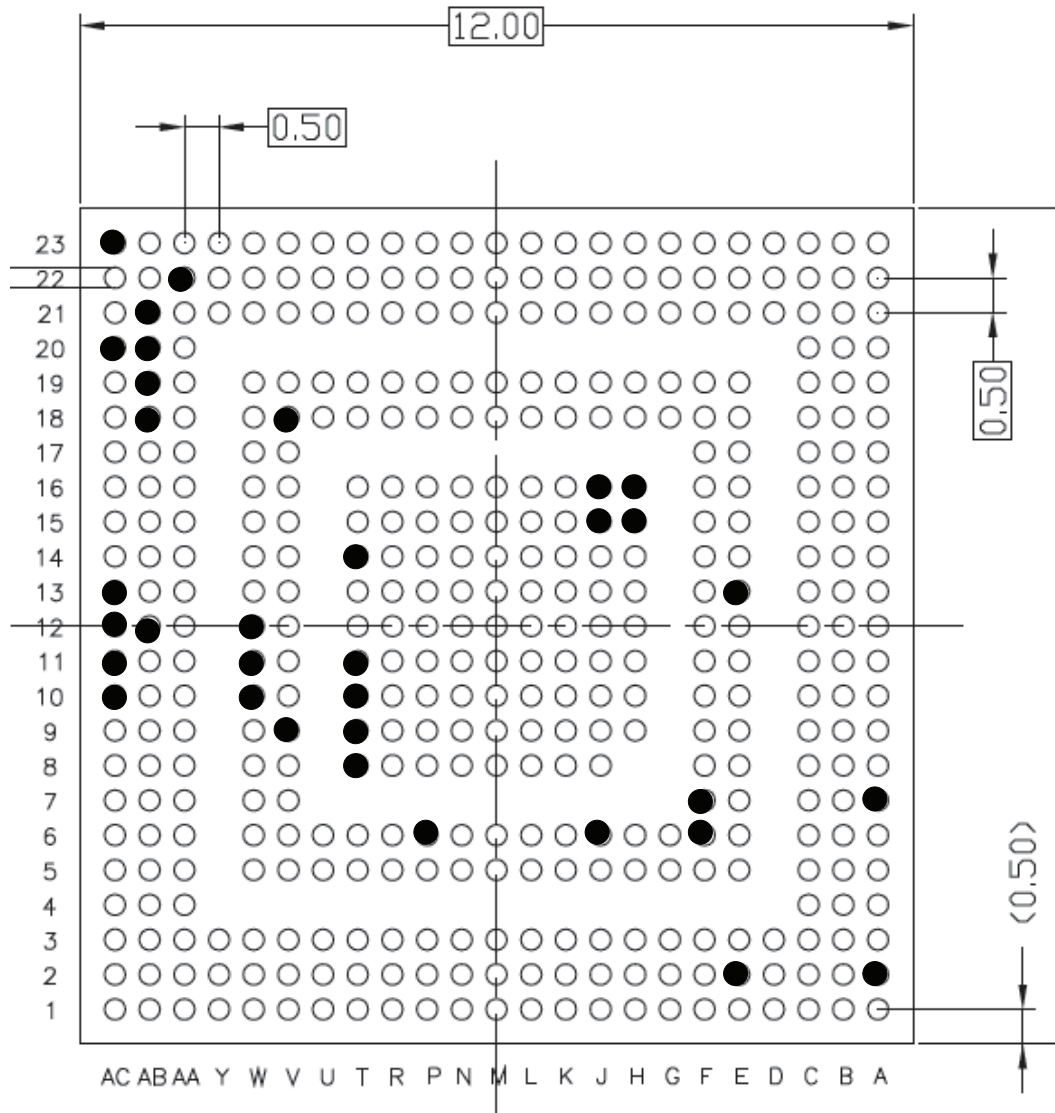


7. CIRCUIT DIAGRAM



8. BGA PIN MAP

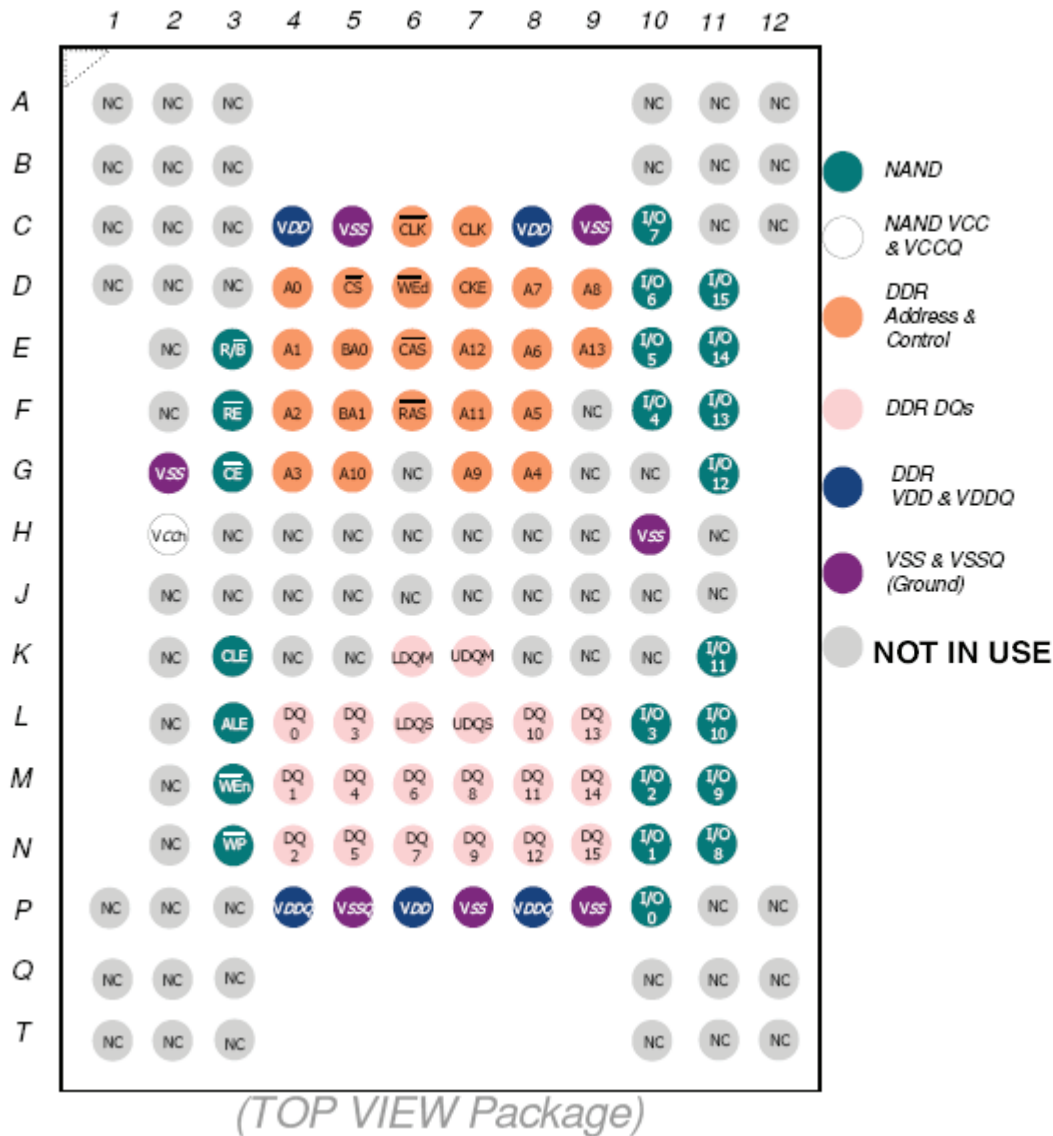
QSC6270 - U200 (bottom view)



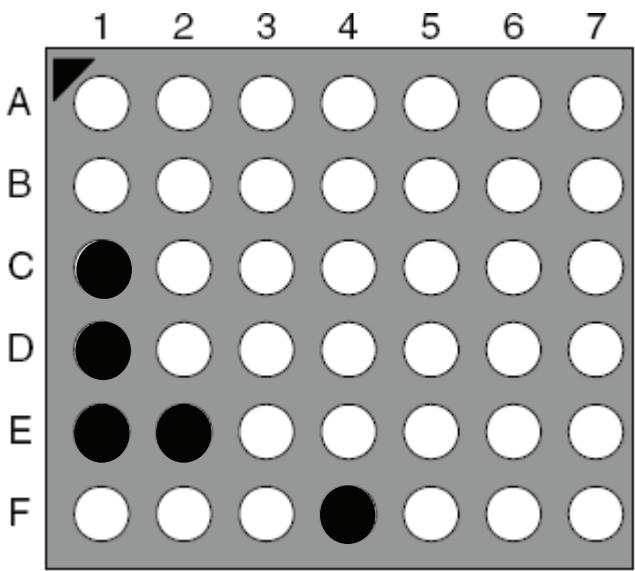
○ USE
● NOT IN USE

8. BGA PIN MAP

H8BCS0S10BAR-46M (MCP,NAND) – U300 (EUSY0347506)



BCM2070B2KUBXG (bluetooth) – U700 (EUSY0418701)



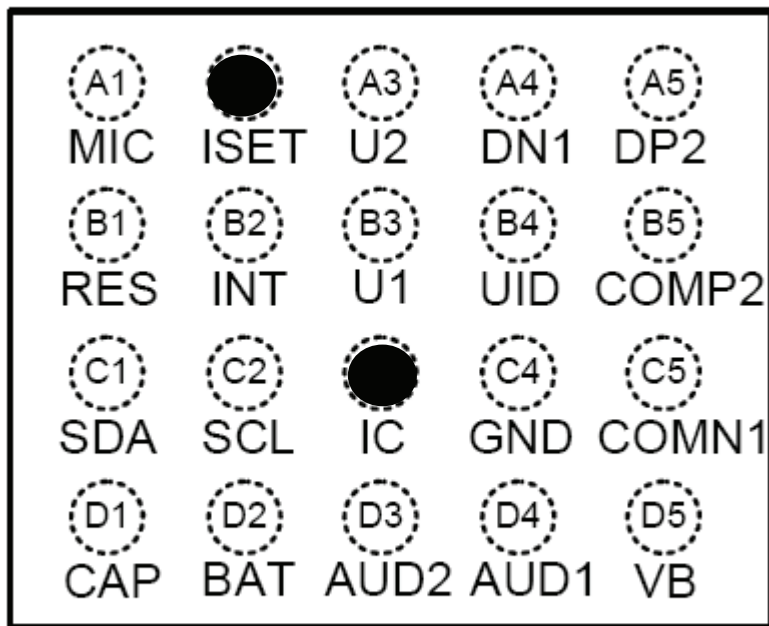
42-Bump 2.97 x 2.46 x 0.5 mm Array (Top View)

○ USE
● NOT IN USE

8. BGA PIN MAP

RT8963WSC (Multiplexer Mini/Micro USB Interface)– IC400 (EUSY0424801)

(TOP VIEW)



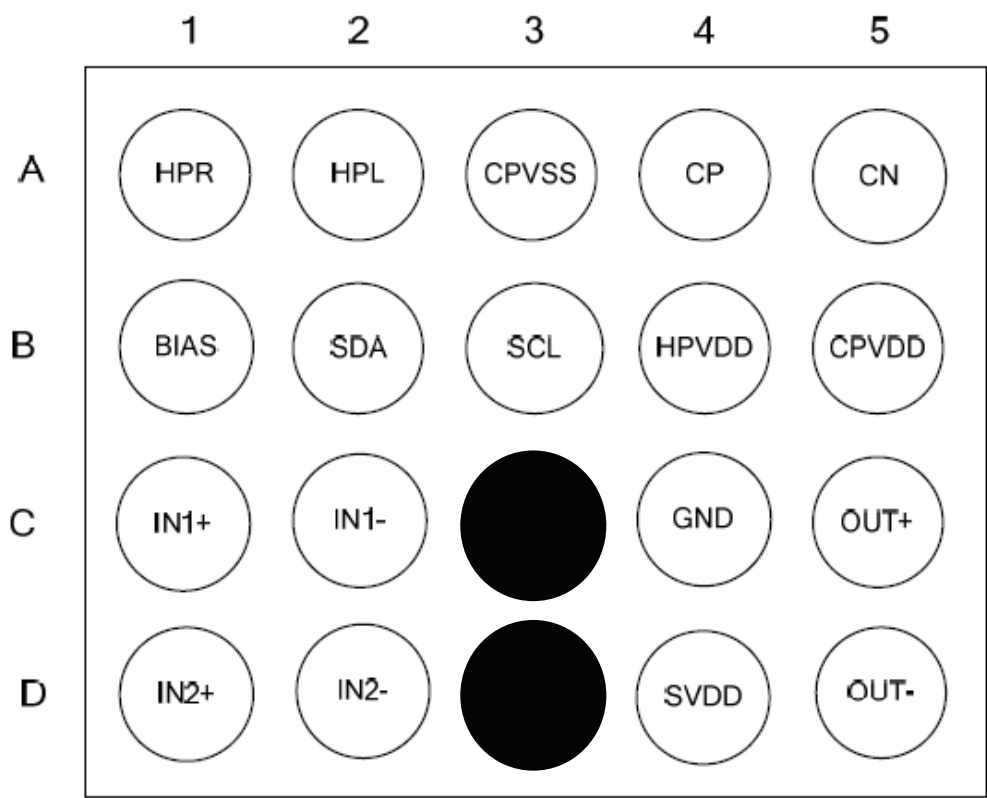
WL-CSP-20B 2.45x1.95

○ USE

● NOT IN USE

WM9093 (Ultra Low Power Audio Subsystem)– IC500 (EUSY0403901)

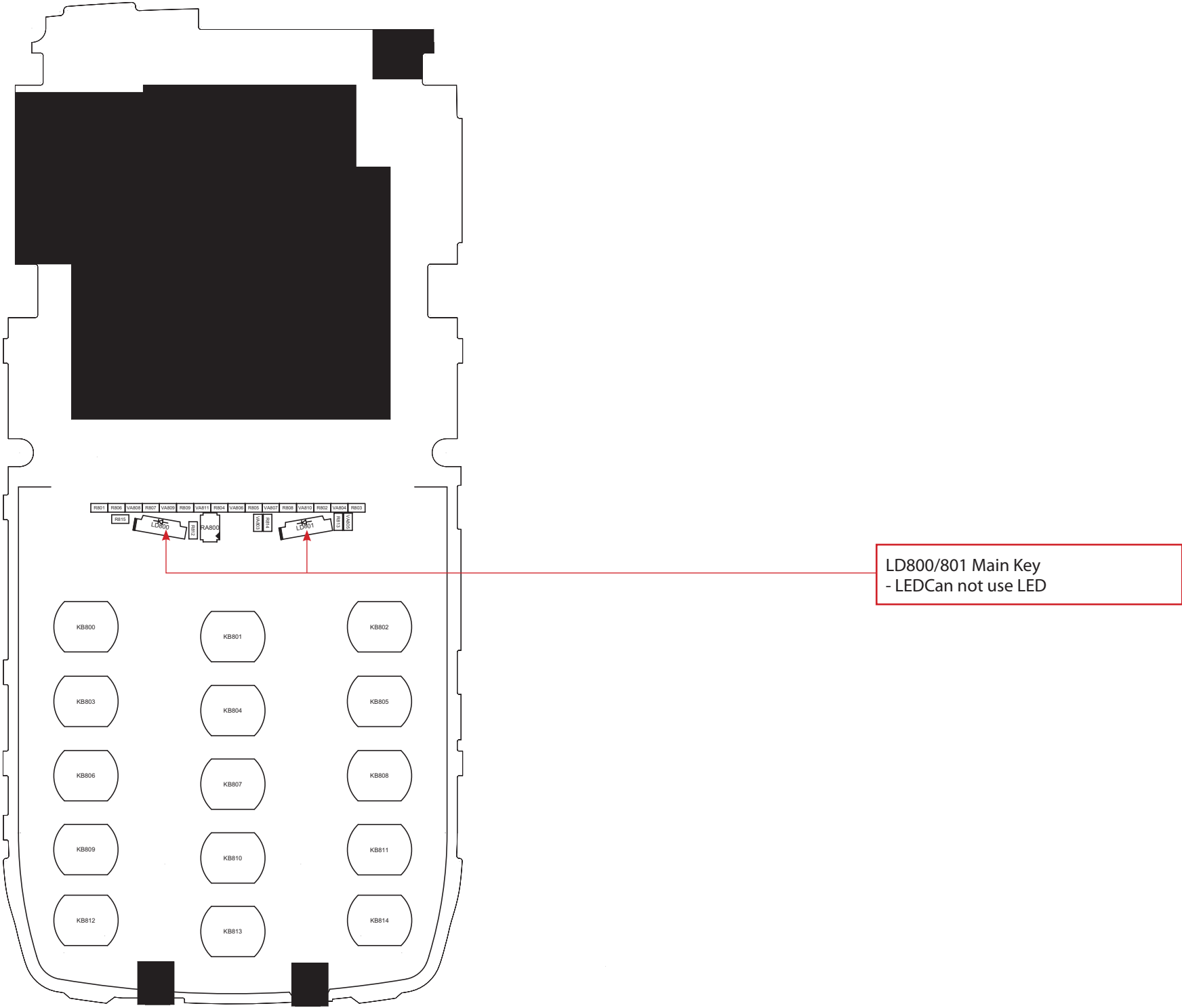
20-bump CSP package; Top View



○ USE
● NOT IN USE

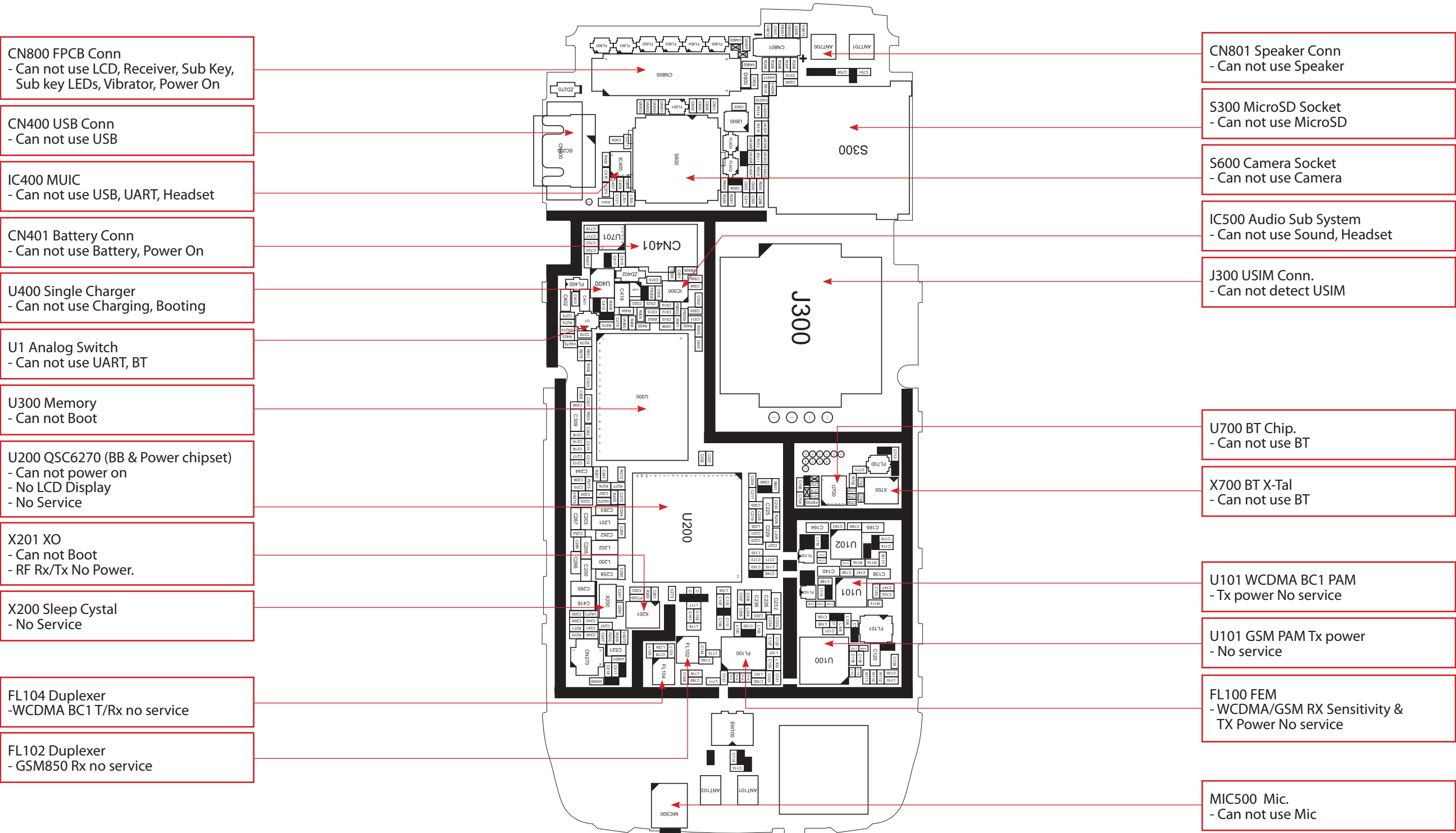


9. PCB LAYOUT



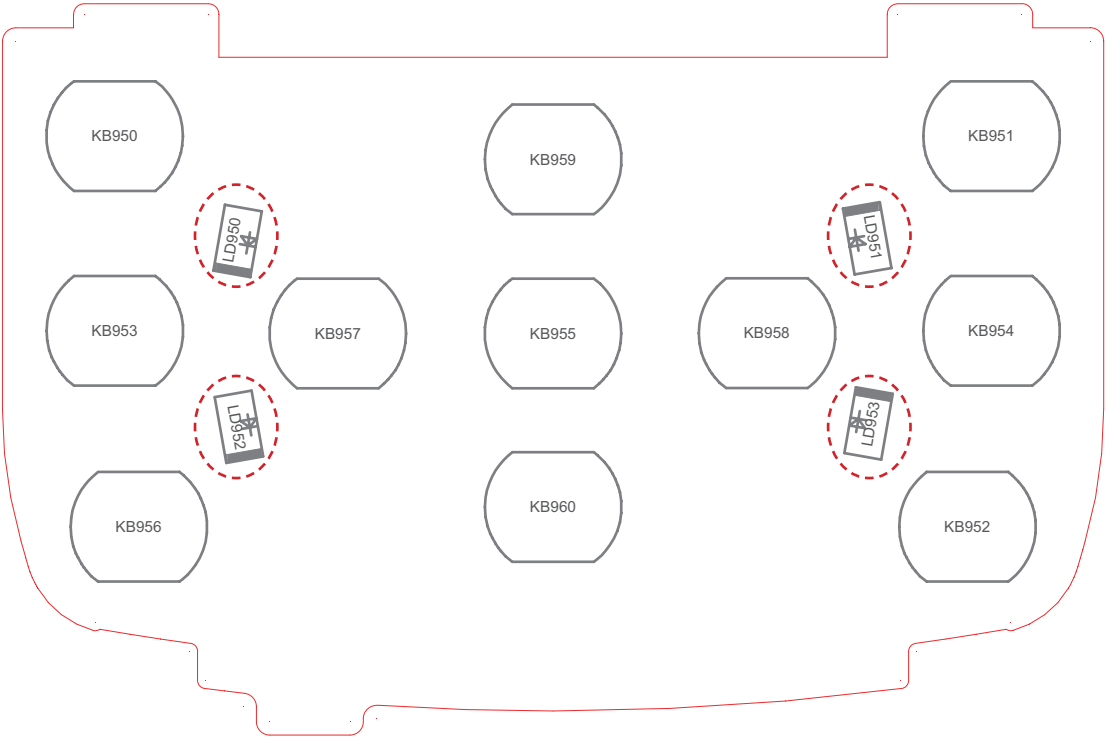
LG-A310_MAIN_SPFY0232301_1.0_TOP

9. PCB LAYOUT



LG-A310_MAIN_SPFY0232301_1.0_BOT

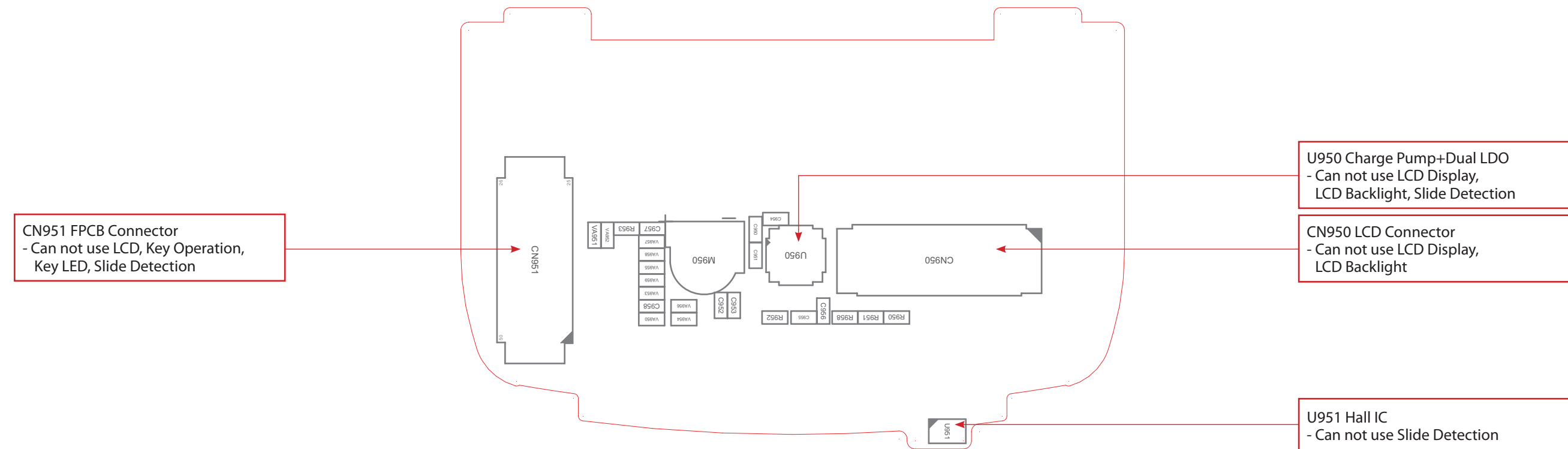
9. PCB LAYOUT



LD950 ~ LD953 Sub Key LED
- Can not use Key LED

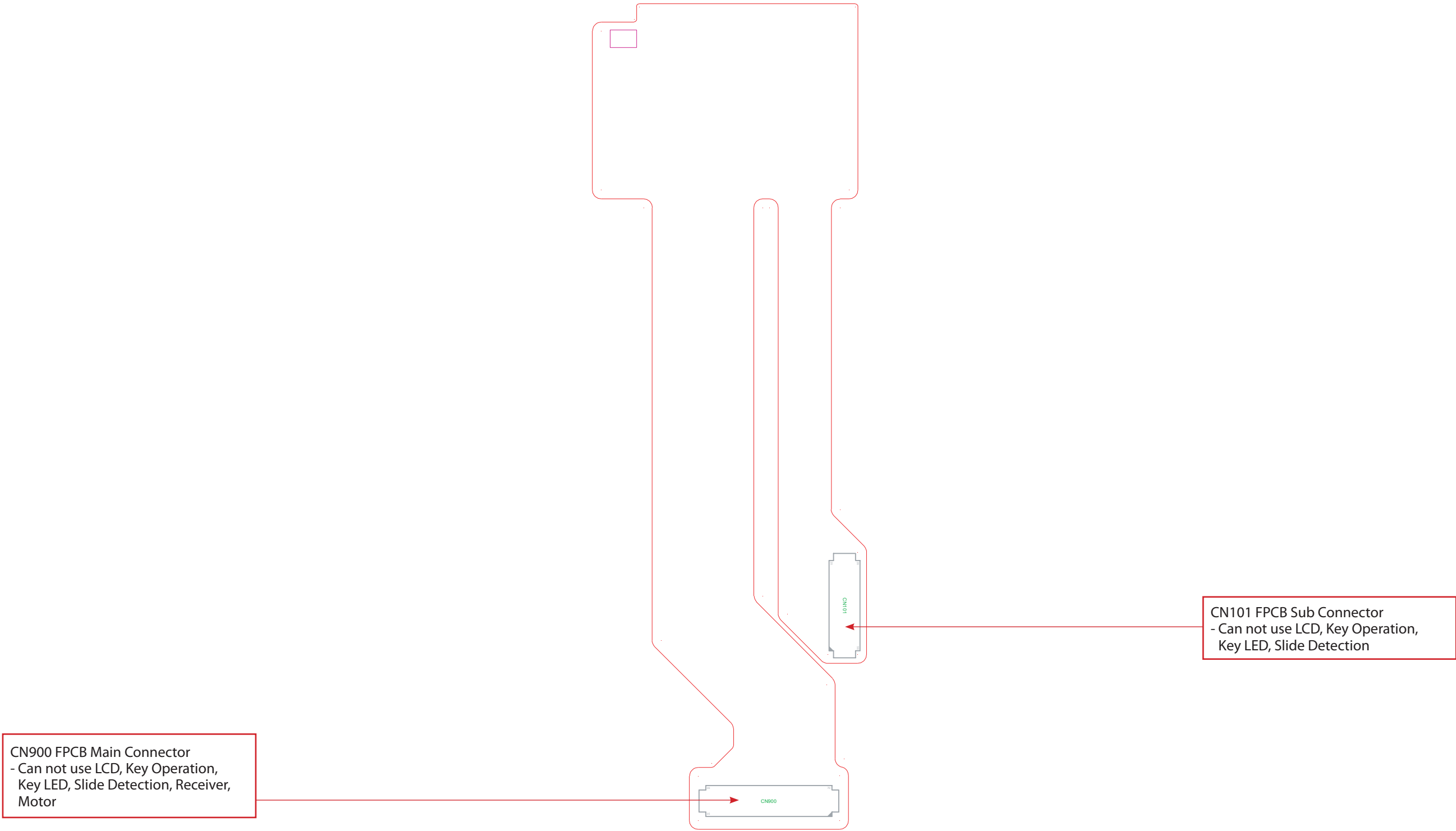
LG-A310_KEY_SPEY0067701-1.0_TOP

9. PCB LAYOUT



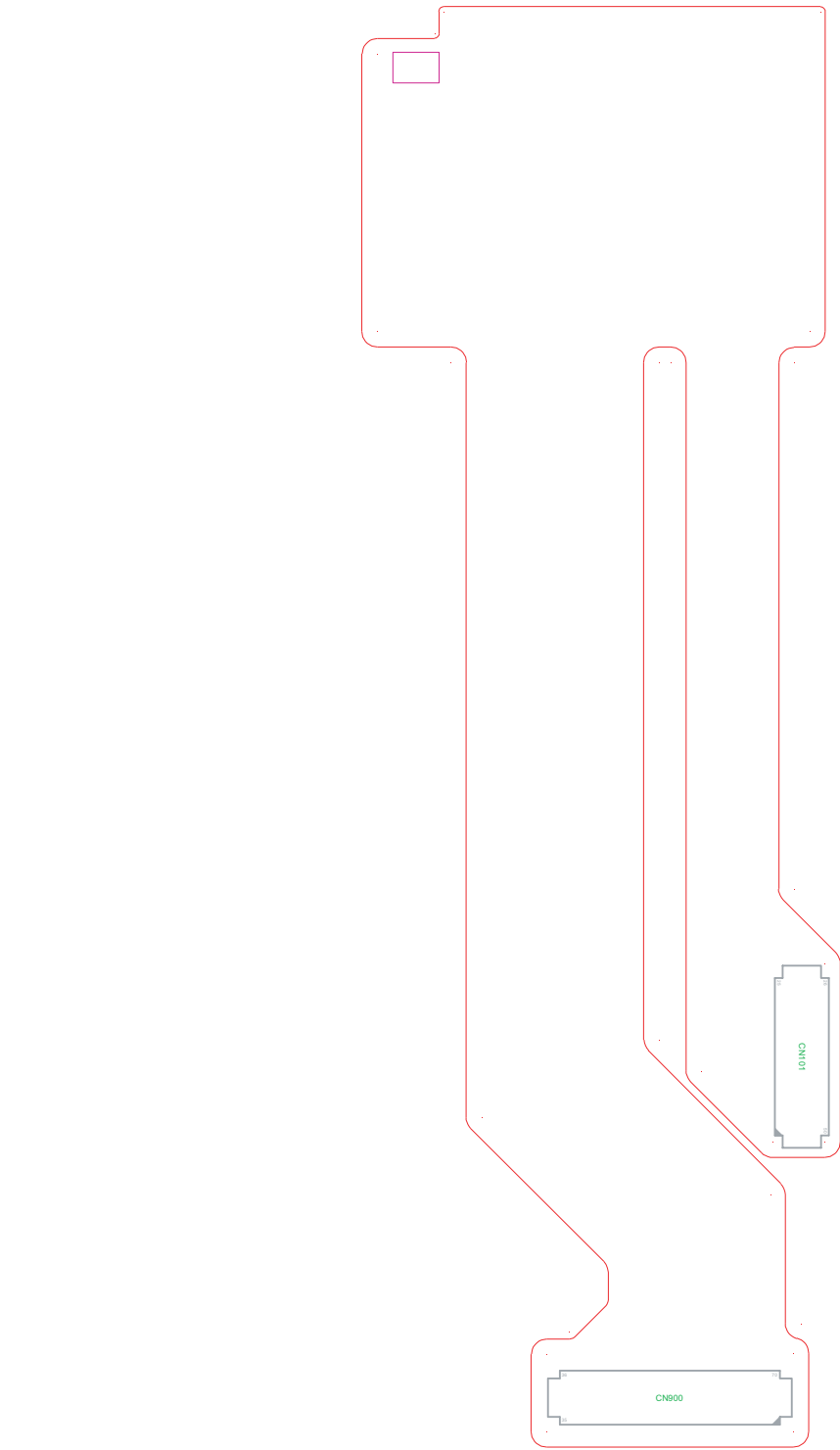
LG-A310_KEY_SPEY0067701-1.0_BOT

9. PCB LAYOUT



LG-A310_F_LCD_SPCY0243101-1.0_TOP

9. PCB LAYOUT



LG-A310_F_LCD_SPCY0243101-1.0_BOT

10. CALIBRATION

10.1 Usage of Tachyon for RF Calibration and Test

10.1.1 Preparation work for setting RF cable loss

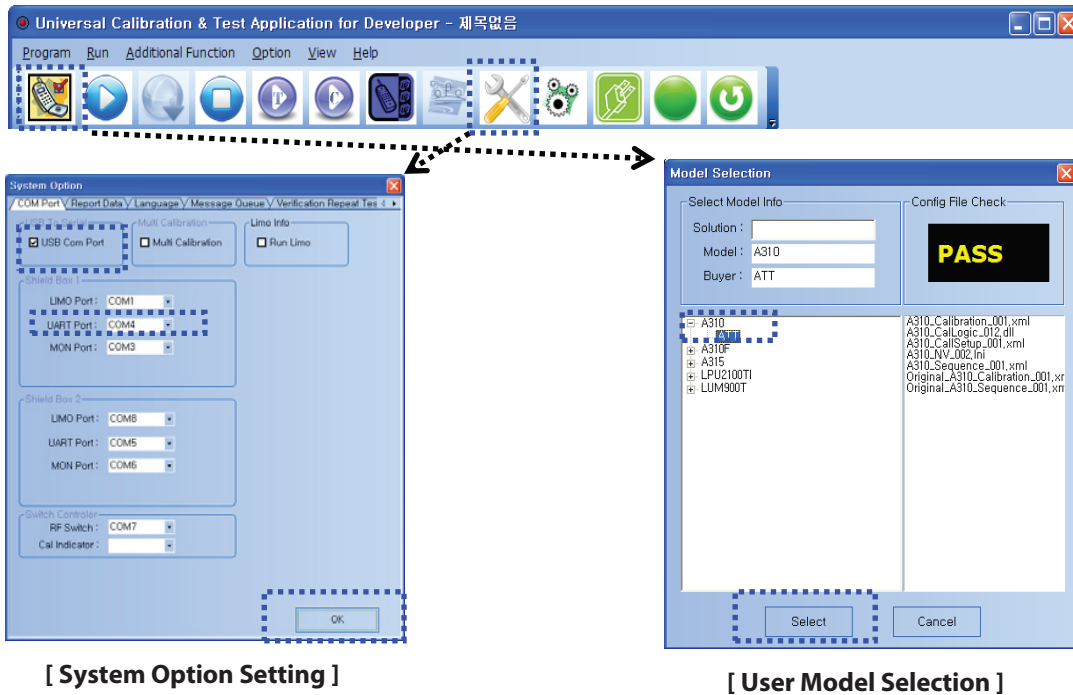


● Procedure

1. Click "Hecaton.exe" in below directory to set RF cable loss on test equipment.
✓ "C:\LGE\Tachyon\Utilities"
2. After selecting "Select File" button, select right RF cable loss file corresponding to RF cable that you use.

10. CALIBRATION

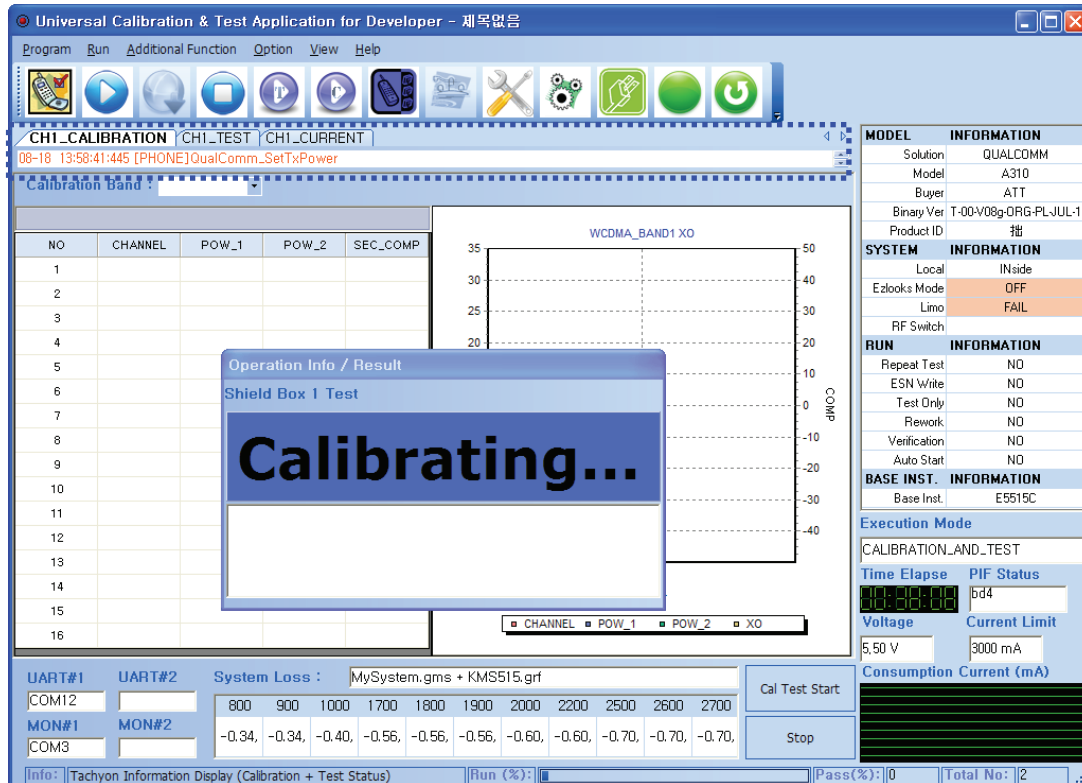
10.1.2 Basic Setting of Tachyon for RF Calibration & Test



● Procedure

1. Click "Tachyon_xxx.exe" in below directory to execute Tachyon program.
 - ✓ "C:\LGE\Tachyon\"
2. Click "System Option Setting" icon in the menu to set COM port.
 - ✓ Select "UART Port" that can communicate with phone in the Shield Box 1 message.
 - ✓ Click the "OK" button.
3. Click "User Model Selection" icon in the menu to set model configuration.
 - ✓ Do double-click model/buyer name that you want to calibrate and test.
 - ✓ Click the "Select" button.

10.1.3 Log of RF Calibration and Test



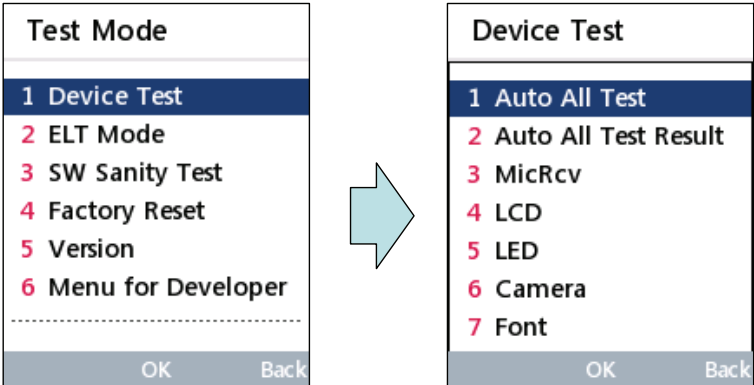
● Contents

- ✓ On Running, log window is created in upper area.
It displays logs of phone commands and measurements for RF calibration and test.
- ✓ The result files are saved in below directory
 - "C:\LGE\Tachyon\Report\CalData\" : the file of RF calibration result
 - "C:\LGE\Tachyon\Report\TestData\" : the file of RF test result

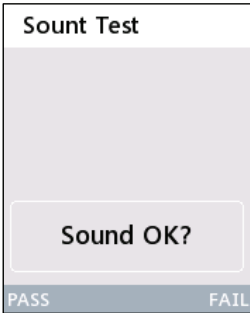
11. TEST MODE

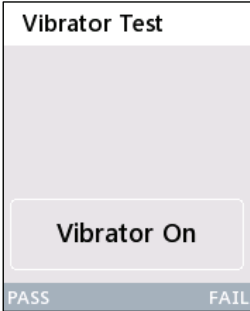
11. TEST MODE

- 1. Enter the Engineer Menu
- 2. Tap 1. Device Test
- 3. Tap 1. Auto ALL Test

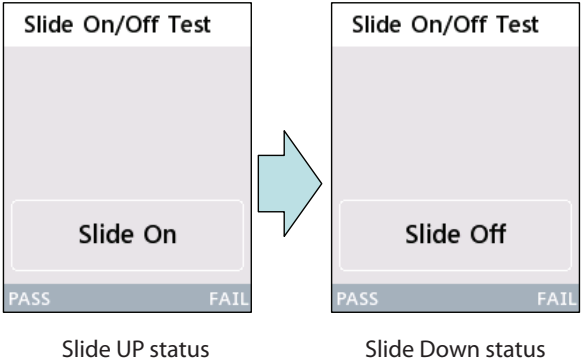


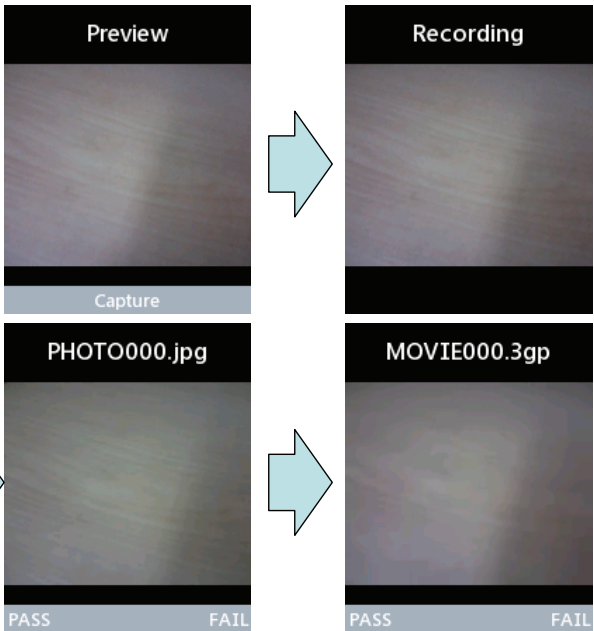
Item	Order	Description
(1) Key Press, External Memory, and SIM card Test Start	1.Key, External Memory, and SIM card Test	☐ Key Test Key Press Test LSK Multi Left Send Quick 1 4 7 * SIM Pass RSK Up Ok Down CAM 2 5 8 0 SD Pass Clear Right End MSG 3 6 9 # External memory and SD card is inserted then Sing of "SIM Pass" and "SD Pass" is green. Key Press Test LSK Multi Left Send Quick 1 4 7 * SIM Pass RSK Up Ok Down CAM 2 5 8 0 SD Pass Clear Right End MSG 3 6 9 # PASS * Key FAIL Press all keys for test - UP key - Down key - Right key - Left key

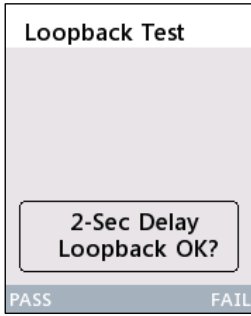
Item	Order	Description
(2) Sound	1. Sound On 2. IF OK, tab "LSK" Button. It means "PASS"	 Ringtone (MP3) is played regularly Press "LSK" button (Left top Key) Move to next step

Item	Order	Description
(3) Vibrator Test	1.Vibrator On 2. IF OK, tab “LSK” Button. It means “PASS”	 Press “LSK” button (Left top Key) Move to next step

11. TEST MODE

Item	Order	Description
(4) Slide On/Off Test	1. Move Slide Up and Down 2. IF OK, tab "LSK" Button. It means "PASS"	 Slide UP status Slide Down status Press "LSK" button (Left top Key) Move to next step`

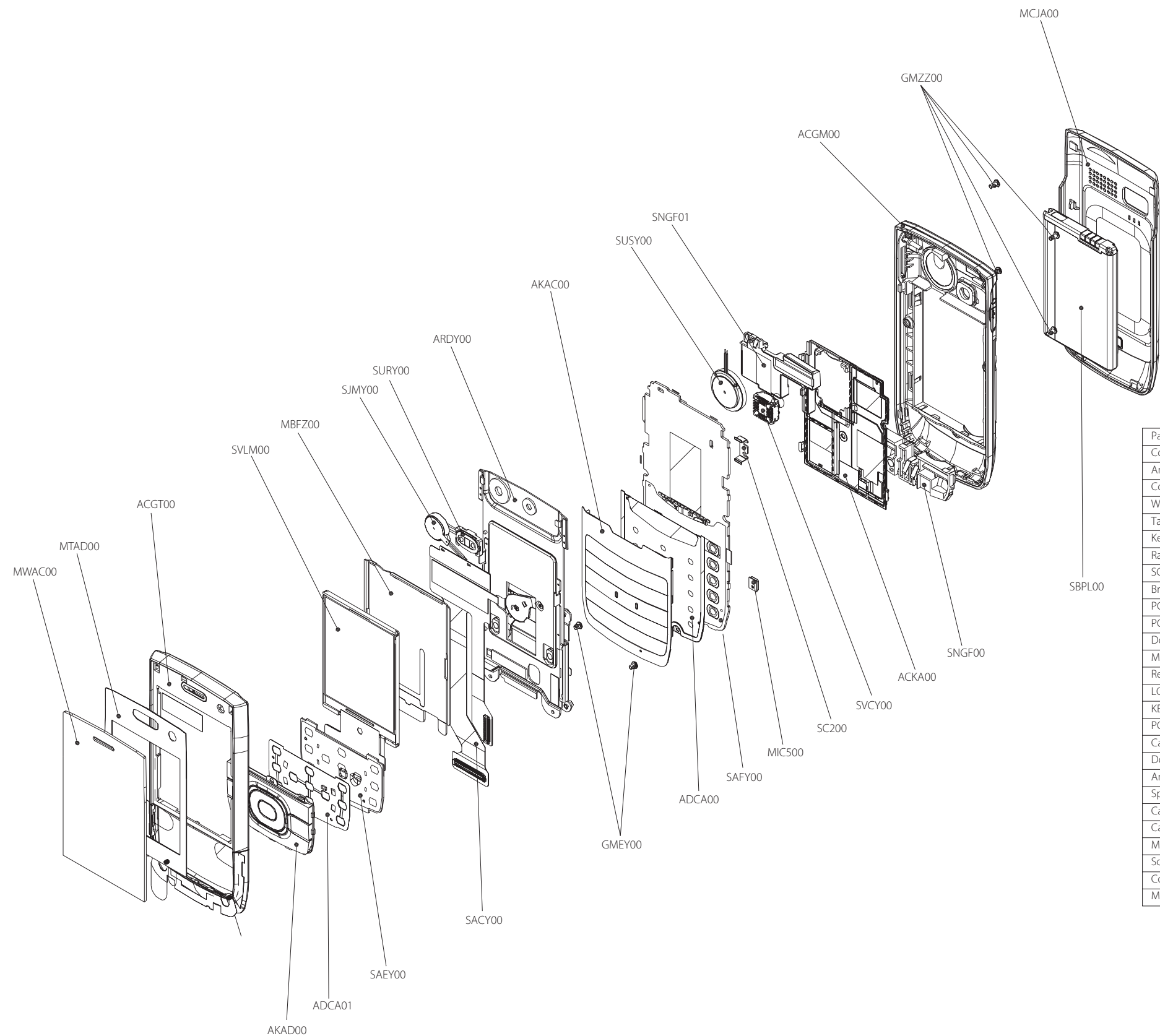
Item	Order	Description
(5) Camera Test	1. Camera Off 2. Camera Auto On (Preview) 3. Photo Shot by press "OK" key 4. Photo Save 5. Record video 6. Video Save 7. Call Photo If OK , Press "LSK" key (Left top Key) 8. Call Video 9. Preview 10. IF OK, tab "LSK" Button. It means "PASS"	

Item	Order	Description
(6) Loopback Test	1. Loopback On 2. Speak something 3. After 2 Sec, listen the voice 4. IF OK, tab "LSK" Button. It means "PASS" 5. The TEST END	 Press "LSK" button (Left top Key) TEST END



12. EXPLODED VIEW & REPLACEMENT PART LIST

12.1 EXPLODED VIEW



Part Name	Location NO.
Cover Assembly,Rear	ACGM00
Antenna,Helical	SNGF00
Cover Assembly,Upper	ACGT00
Window,LCD	MWAC00
Tape,Window	MTAD00
Keypad Assembly,Sub	AKAD00
Rail Assembly,Slide	ARDY00
SCREW MACHINE,BIND	GMEY00
Bracket	MBFZ00
PCB Assembly,Flexible	SACY00
PCB Assembly,Keypad	SAEY00
Dome Assembly,Metal	ADCA01
Motor,DC	SJMY00
Receiver	SURY00
LCD,Module-TFT	SVLM00
KEYPAD ASSY,MAIN	AKAC00
PCB Assembly,Main	SAFY00
Can Assembly,Shield	ACKA00
Dome Assembly,Metal	ADCA00
Antenna,Helical	SNGF01
Speaker,Dual Mode	SUSY00
Camera Module	SVCY00
Can,Shield	SC200
Microphone,Condenser	MIC500
Screw,Machine	GMZZ00
Cover,Battery	MCJA00
Mobile Phone Battery Li-Ion	SBPL00

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.2 Replacement Parts <Mechanic component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Remark
1	AAAY	Addition Assembly	AAAY0524301  7	LG-A310 ORPVD VD:Silver Gold -	
2	AMBA00	Manual Assembly,Operation	AMBA0188401  3	LG-A310 ORPVD ZZ:Without Color LG-A310 manual assy for ORP	
3	MCDD00	Card,Quick Reference	MCDD0034501	COMPLEX LG-A310 ORPVD ZZ:Without Color PRINTING,(empty),	
3	MCDF	Card,Warranty	MCDF0001108	COMPLEX KP202 ERA ZZ:Without Color -	
2	MCJA00	Cover,Battery	MCJA0117402	COMPLEX LG-A310 ORF ZZ:Without Color Orange Logo	
1	APAY00	Package Assembly	APAY0152001  8	LG-A310 ORPVD ZZ:Without Color LG-A310 ORP(EU1/ORG UB/POL LB_CH/SEAL/1200ea)	
2	APLY00	Pallet Assembly	APLY0003901  3	GD510 BALBK ZZ:Without Color EU1 TYPE_Body(SW)+Cap(EU)+AL_1200EA	
3	MBEC00	Box,Carton	MBEC0003601	COMPLEX GD510 CZESV ZZ:Without Color -	
3	MCCL00	Cap,Box	MCCL0002501	COMPLEX GD510 CZESV ZZ:Without Color -	
3	MPCY00	Pallet	MPCY0012403	COMPLEX KG800 FRABK DB:DARK BLUE -	
2	MBAD00	Bag,Vinyl	MBAD0005204	COMPLEX LG-LX260 SPRAG ZZ:Without Color -	
2	MBEE00	Box,Master	MBEE0061001	COMPLEX GD510 CZESV ZZ:Without Color -	
2	MBEF00	Box,Unit	MBEF0150701	COMPLEX LG-A310 ORPVD ZZ:Without Color PRINTING,LG-A310 Orange Box(EU1)	
2	MLAC00	Label,Barcode	MLAC0004531	COMPLEX KG275 PLSBK ZZ:Without Color PRINTING, PPRI PRINTING	
2	MLAJ00	Label,Master Box	MLAJ0004402	COMPLEX CG300 CGR ZZ:Without Color LABEL,MASTER BOX(for CGR TDR 2VER. mbox_label)	
2	MLAP	Label,Unit	MLAP0001138	COMPLEX LG-RD6100 RLC ZZ:Without Color -	
2	MLAZ00	Label	MLAZ0050901	COMPLEX KU990 GBRBK ZZ:Without Color -	
1	APEY	Phone Assembly	APEY0936303	LG-A310 ORPVD VD:Silver Gold -	
2	ACGY00	Cover Assembly,EMS	ACGY0043703  6	LG-A310 ORPVD VD:Silver Gold -	
3	ACQ063300	Cover Assembly,Rear	ACGM0166901  9	LG-A310 ORF ZZ:Without Color -	
4	MCCZ03	Cap	MCCZ0043501	COMPLEX LG-A310 ORF ZZ:Without Color -	
4	MCCZ02	Cap	MCCZ0043601	COMPLEX LG-A310 ORF ZZ:Without Color -	
4	MCJN03	Cover,Rear	MCJN0125801	COMPLEX LG-A310 ORF ZZ:Without Color -	
4	MPBN02	Damper,Speaker	MPBN0091201	COMPLEX LG-A310 ORF ZZ:Without Color -	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
4	MPBT03	Damper,Camera	MPBT0098401	COMPLEX LG-A310 ORF ZZ:Without Color -	
4	MCQ000000	Damper	MPBZ0357801	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
4	MTAD02	Tape,Window	MTAD0132201	COMPLEX LG-A310 ORF ZZ:Without Color -	
4	MWAE02	Window,Camera	MWAE0064201	COMPLEX LG-A310 ORF ZZ:Without Color -	
3	ACGQ00	Cover Assembly,Slide	ACGQ0053602 12	LG-A310 ORPVD VD:Silver Gold -	
4	ACGT00	Cover Assembly,Upper	ACGT0008501 11	LG-A310 ORF ZZ:Without Color -	
5	MCK084400	Cover,Upper	MCJX0010901	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MCR000000	Decor	MDAY0082601	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
6	MICE00	Insert,Nut	MICE0016901	COMPLEX MECH_COMMON ZZ:Without Color -	
5	MDJ000000	Filter	MFBZ0023101	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MCQ000000	Damper	MPBZ0331501	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
5	MJN020800	Tape,Decor	MTAA0228201	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MJN089300	Tape,Window	MTAD0133001	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MJN089400	Tape,Window(Sub)	MTAE0038201	COMPLEX KB775Q VIV ZZ:Without Color -	
5	MJN000001	Tape	MTAZ0335901	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MJN000000	Tape	MTAZ0377601	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
5	MJN000002	Tape	MTAZ0377701	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
5	MKC043300	Window,LCD	MWAC0150101	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
4	AKAD00	Keypad Assembly,Sub	AKAD0005001	LG-A310 ORF ZZ:Without Color -	
4	ARDY00	Rail Assembly,Slide	ARDY0017201 7	LG-A310 ORF ZZ:Without Color -	
5	MIDZ00	Insulator	MIDZ0264501	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MPBU01	Damper,Connector	MPBU0110301	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MPBU00	Damper,Connector	MPBU0110401	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MPBZ01	Damper	MPBZ0313801	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MPBZ02	Damper	MPBZ0314101	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
5	MPBZ00	Damper	MPBZ0357901	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
5	MTAZ00	Tape	MTAZ0336101	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
4	GMEY00	Screw,Machine	GMEY0010402	GMEY0010402 BH + 1.4mm 2mm MSWR FZB N -SERVEONE CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
4	MBFZ00	Bracket	MBFZ0052701	COMPLEX LG-A310 ORF ZZ:Without Color PRESS,STS,	
4	MIDZ00	Insulator	MIDZ0264701	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
4	MIDZ01	Insulator	MIDZ0264801	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX,(empty),	
6	ADB048600	Dome Assembly,Metal	ADCA0117201	LG-A310 ORF ZZ:Without Color SUB	
3	AKAC00	Keypad Assembly,Main	AKAC0018002	LG-A310 ORPVD VD:Silver Gold -	
3	GMZZ00	Screw,Machine	GMZZ0017701	GMZZ0017701 BH + 1.4mM 3mM MSWR NI PLT N -ASIA BOLT	
3	MLAA00	Label,Approval	MLAA0062303	COMPLEX KB770 DEUBK ZZ:Without Color -	
5	ACKA00	Can Assembly,Shield	ACKA0031401 4	LG-A310 ORF ZZ:Without Color LG-A310 ORF	
6	MKU101700	Absorber,Electromagnetic Wave	MAAA0007301	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
6	MKU101701	Absorber,Electromagnetic Wave	MAAA0007401	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
6	MEV000000	Insulator	MIDZ0280801	COMPLEX LG-A310 ORF ZZ:Without Color COMPLEX, (empty), , , ,	
6	MEZ000900	Label,After Service	MLAB0001102	COMPLEX C2000 CGRSV WA:White C2000 USASV DIA 4.0 PRINTING,	
5	ADCA00	Dome Assembly,Metal	ADCA0117301	LG-A310 ORF ZZ:Without Color LG-A310 ORF	
5	MLAZ00	Label	MLAZ0038301	COMPLEX LG-VX6000 ZZ:Without Color PID Label 4 Array PRINTING,	
6	SC200	Can,Shield	MCBA0059201	COMPLEX GD350 CLP ZZ:Without Color -	

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.2 Replacement Parts <Main component>

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Remark
4	SNGF00	Antenna, Helical	SNGF0063501	A310-MAIN-LAIRD MULTI -2DB 50OHM 3LAIRD TECHNOLOGIES KOREA	
4	SACY00	PCB Assembly, Flexible	SACY0120602 2	LG-A310 ORPVD FLEXIBLE, 1.0	
5	SACB00	PCB Assembly, Flexible, Insert	SACB0067302	LG-A310 ORPVD FLEXIBLE, A	
5	SACE00	PCB Assembly, Flexible, SMT	SACE0108902 3	LG-A310 ORPVD FLEXIBLE, 1.0	
6	SACC00	PCB Assembly, Flexible, SMT Bottom	SACC0082002 2	LG-A310 ORPVD FLEXIBLE, 1.0	
7	C900, C901	Capacitor, Ceramic, Chip	ECCH0000115	MCH155A220JK 22pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
7	VA900, VA901	Varistor	SEVY0003901	EVL5M02200 5.5V 0% 480F 1.0*0.5*0.6 NONE SMD R/TPAMOTECH CO., LTD.	
6	SACD00	PCB Assembly, Flexible, SMT Top	SACD0095702 2	LG-A310 ORPVD FLEXIBLE, 1.0	
7	CN101	Connector, BtoB	ENBY0040401	GB042-50P-H10-E3000 50P 0.4MM STRAIGHT PLUG SMD R/TP 1M -LS Mtron Ltd.	
7	CN900	Connector, BtoB	ENBY0041401	GB042-70P-H10-E3000 70P 0.4MM STRAIGHT MALE SMD R/TP 1M -LS Mtron Ltd.	
6	SPCY	PCB, Flexible	SPCY0243101	SPCY0243101 GU300 ORF, FLEXIBLE, A, POLYI, 0.2 mm, DOUBLE DAE DUCK GDS CO., LTD	
4	SAEY	PCB Assembly, Keypad	SAEY0072903 2	LG-A310 ORPVD KEYPAD, 1.0	
5	SAEB00	PCB Assembly, Keypad, Insert	SAEB0033402	LG-A310 KEYPAD 1.0	
5	SAEE00	PCB Assembly, Keypad, SMT	SAEE0038803 2	LG-A310 ORPVD KEYPAD, 1.0	
6	SAEC00	PCB Assembly, Keypad, SMT Bottom	SAEC0037803 12	LG-A310 ORPVD KEYPAD, 1.0	
7	C958	Capacitor, Ceramic, Chip	ECCH0000110	MCH155A100D 10pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
7	C953, C957	Capacitor, Ceramic, Chip	ECCH0000198	CL05A225MQ5NSNC 2.2uF 20% 6.3V X5R -55TO+85C 1005 R/TP .SAMSUNG ELECTRO-MECHANICS CO., LTD.	
7	C950, C951, C952, C954, C955, C956	Capacitor, Ceramic, Chip	ECCH0004904	GRM155R60J105K 1uF 10% 6.3V X5R -55TO+85C 1005 R/TP - MURATA MANUFACTURING CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
7	CN951	Connector,BtoB	ENBY0040501	GB042-50S-H10-E3000 50P 0.4MM STRAIGHT SOCKET SMD R/TP 1M -LS Mtron Ltd.	
7	CN950	Connector,FFC/FPC/PIC	ENQY0013901	04-6293-635-005-829+ 35P 0.30MM FPC ANGLE BOTH SMD R/TP LOCKING FLIP TYPEKYOCERA ELCO KOREA SALES CO.,LTD.	
7	R953	Resistor,Chip	ERHY0000254	MCR01MZP5J472 4.7KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
7	R952	Resistor,Chip	ERHZ0000467	MCR01MZP5J334 330KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
7	R950,R951, R958	Resistor,Chip	ERHZ0000486	MCR01MZP5J473 47KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
7	U950	IC,Charge Pump	EUSY0344402	RT9367C QFN,20,R/TP,4CH,2LDO,3X3,IC,Sub PMICIC,Sub PMIC RICHTEK TECHNOLOGY CORP.	
7	U951	IC,CMOS	EUSY0362601	BU52031NVX SSON004,4,R/TP,Hall IC,IC,CMOSIC,CMOS ROHM.	
7	VA950, VA951, VA952, VA953, VA954, VA955, VA956, VA957, VA958, VA959	Varistor	SEVY0001001	EVLC14S02050 14V 0% 50F 1.0*0.5*0.6 NONE SMD R/TPAMOTECH CO., LTD.	
7	M950	Capacitor Assembly	SMZY0023501	PAS311HR-VG1 3.8 Backup Capacitor 0.03F,Module Assembly, KOREA TAIYO YUDEN.CO., LTD.	
6	SAED00	PCB Assembly,Keypad,SMT Top	SAED0037003 2	LG-A310 ORPVD KEYPAD,1.0	
7	LD950,LD951, LD952,LD953	LED,Chip	EDLH0015102	19-217/UTD-S887-2/TR8 WHITE 2.7~3.1 30mA 90~180mcd x, y 110mW 1608 R/TP 2P -EVERLIGHT ELECTRONICS CO., LTD.	
7	SPEY	PCB,Keypad	SPEY0067701	SPEY0067701 FR-4 Multi MULTI-4 0.5 GU300 ORF,KEYPAD,C,FR-4,0.5 mm,MULTI-4UNITECH PRINTED CIRCUIT BOARD CORP.	
4	SJMY00	Motor,DC	SJMY0007105	WHVM-1027B10 3V 80mA 0A 12KRPM 0RPM 0SEC 0GF.CM 0OHMWOOSUNG G&T CO.,LTD	
4	SURY00	Receiver	SURY0015202	EMR1207SWB1P ASSY,104 dB,8 ohm,1207*2.7T,10mm Wideband,WIRE, EM-TECH	
4	SVLM00	LCD,Module-TFT	SVLM0035501	SVLM0035501 Main,2.0,176*220,36.18*49.9*1.75T,262K,TFT,TM,LG4525B,. LG Display Co. Ltd.	
3	SAFY00	PCB Assembly,Main	SAFY0379704 2	LG-A310 ORPVD MAIN,A	
4	SAFB00	PCB Assembly,Main,Insert	SAFB0123302 7	LG-A310 MAIN 1.1	
5	BRAH00	Resin,PC	BRAH0001301	UF-1060	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
5	BRAH01	Resin	BRAH0002601	UNIQUE4000HFW ; , , , [empty] , , [empty] SERVEONE CO., LTD.	
5	SNGF01	Antenna, Helical	SNGF0063601	712839.0001 SINGLE -2DB 50OHM 3LAIRD TECHNOLOGIES KOREA	
5	SUSY00	Speaker, Dual Mode	SUSY0028021	EMS1630BLW3P Nd-Fe-B 800mW 8OHM 90DB 750HZ 16pi*3.0T CONNECTOREM-TECH	
5	SVCY00	Camera Module	SVCY0026901	C2FK-H313A C2FK-H313A 2M FF, Hynix(1/5"), 7x7x4.1t, SocketLG Innotek.com	
4	SAFF00	PCB Assembly, Main, SMT	SAFF0280904 4	LG-A310 ORPVD MAIN, A	
5	SAFC00	PCB Assembly, Main, SMT Bottom	SAFC0150604 138	LG-A310 MAIN 1.1	
6	C106, C111, C711	Capacitor, Ceramic, Chip	ECCH0000110	MCH155A100D 10pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C118	Capacitor, Ceramic, Chip	ECCH0000112	MCH155C150J 15pF 5% 50V NP0 -55TO+125C 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	C300, C302, C311, C403, C405, C406	Capacitor, Ceramic, Chip	ECCH0000115	MCH155A220JK 22pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C506, C507	Capacitor, Ceramic, Chip	ECCH0000120	MCH155A390J 39pF 5% 50V NP0 -55TO+125C 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	C274, C275, C407	Capacitor, Ceramic, Chip	ECCH0000122	MCH155A470JK 47pF 5% 50V NP0 -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C139	Capacitor, Ceramic, Chip	ECCH0000127	MCH155A820J 82pF 5% 50V NP0 -55TO+125C 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	C119, C227	Capacitor, Ceramic, Chip	ECCH0000143	MCH155CN102KK 1nF 10% 50V X7R -55TO+125C 1005 R/TP - ROHM Semiconductor KOREA CORPORATION	
6	C804	Capacitor, Ceramic, Chip	ECCH0000182	GRM155R61A104K 0.1uF 10% 10V X5R -55TO+85C 1005 R/TP - MURATA MANUFACTURING CO., LTD.	
6	L105	Capacitor, Ceramic, Chip	ECCH0000195	GRM1555C1H3R9C 3.9pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -MURATA MANUFACTURING CO., LTD.	
6	C224, C237, C249, C252, C254, C257, C268, C512, C513, C514, C515, C516	Capacitor, Ceramic, Chip	ECCH0000198	CL05A225MQ5NSNC 2.2uF 20% 6.3V X5R -55TO+85C 1005 R/TP .SAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C115	Capacitor, Ceramic, Chip	ECCH0000701	C1005C0G1H1R2CT000F 1.2pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -TDK CORPORATION	
6	C279	Capacitor, Ceramic, Chip	ECCH0002001	C1005JB0J104KT000F 0.1uF 10% 6.3V Y5P -30TO+85C 1005 R/TP -TDK CORPORATION	
6	C206, C208, C209, C247, C408, C600, C601	Capacitor, Ceramic, Chip	ECCH0004904	GRM155R60J105K 1uF 10% 6.3V X5R -55TO+85C 1005 R/TP - MURATA MANUFACTURING CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	C138,C140	Capacitor,Ceramic,Chip	ECCH0005603	GRM188R61A225K 2.2uF 10% 10V X5R -55TO+85C 1608 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C200,C203,C205,C309	Capacitor,Ceramic,Chip	ECCH0005604	GRM188R60J106M 10000000 pF,6.3V,M,X5R,TC,1608,R/TP,0.8 mm MURATA MANUFACTURING CO.,LTD.	
6	C229,C232	Chip Ceramic Capacitor(MLCC)	ECCH0006201	C1608X5R0J475KT000N 4.7uF 10% 6.3V X5R -55TO+85C 1608 R/TP -TDK CORPORATION	
6	C225,C226,C236,C244,C266,C267	Capacitor,Ceramic,Chip	ECCH0007802	CV105X5R475M10AT 4.7uF 20% 10V X5R -55TO+85C 1608 R/TP - KYOCERA CORP.	
6	C120,C258,C262,C263	Capacitor,Ceramic,Chip	ECCH0007803	CL10A106MP8NNNC 10uF 20% 10V X5R -55TO+85C 1608 R/TP 0.8MMSAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C500,C704,C708	Capacitor,Ceramic,Chip	ECCH0007804	CL05A225MP5NSNC 2.2uF 20% 10V X5R -55TO+85C 1005 R/TP 0.5MMSAMSUNG ELECTRO-MECHANICS CO., LTD.	
6	C705,C709,C710	Chip Ceramic Capacitor(MLCC)	ECCH0009106	C0603X7R1C103KT 10nF 10% 16V X7R -55TO+125C 0603 R/TP - TDK CORPORATION	
6	C133	Capacitor,Ceramic,Chip	ECCH0009226	GRM0335C1E390J 39pF 5% 25V X7R -55TO+125C 0603 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	C706,C707	Capacitor,Ceramic,Chip	ECCH0009514	MCH032A(AN)100DK 10pF 0.5PF 25V X7R -55TO+125C 0603 R/TP -ROHM.	
6	C725	Capacitor,Ceramic,Chip	ECCH0009520	MCH032A150JK 15pF 5% 25V X7R -55TO+125C 0603 R/TP - ROHM.	
6	C604,C605	Capacitor,Ceramic,Chip	ECCH0010501	GRM1555C1H7R5D 7.5pF C0G TYPE(No X7R) MURATA MANUFACTURING CO.,LTD.	
6	C521	Capacitor,TA,Conformal	ECTH0004807	TCM1A106M8R 10F 20% 10V 500mA -55TO+85C 15OHM - - SMD R/TPROHM.	
6	C265,C416,C419	Capacitor,TA,Conformal	ECTH0005203	TCTP1A336M8R ,[empty] ,[empty] , ,[empty] , ,[empty] ,[empty] ,[empty] ,[empty] ROHM.	
6	C272	Capacitor,Ceramic,Chip	ECZH0000803	C1005C0G1H020CT000F 2pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C290,C291	Capacitor,Ceramic,Chip	ECZH0000806	C1005C0G1H050CT000F 5pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C107,C112,C122,C126,C157,C160,C233,C240,C241,C242,C243,C700,C701,R700	Capacitor,Ceramic,Chip	ECZH0000813	C1005C0G1H101JT 100pF 5% 50V NP0 -55TO+125C 1005 R/TP - TDK KOREA COOPERATION	
6	C149,C150	Capacitor,Ceramic,Chip	ECZH0000822	C1005C0G1H1R5CT000F 1.5pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C102,C135,C136,C137,C143,C158,C161,C168	Capacitor,Ceramic,Chip	ECZH0000830	C1005C0G1H330JT000F 33pF 5% 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	C123	Capacitor, Ceramic, Chip	ECZH0000839	C1005C0G1H4R7CT000F 4.7pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C130,L107	Capacitor, Ceramic, Chip	ECZH0000841	C1005C0G1H560JT000F 56pF 5% 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C131	Capacitor, Ceramic, Chip	ECZH0000846	C1005C0G1H8R2CT000F 8.2pF 0.25PF 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C152,C178	Capacitor, Ceramic, Chip	ECZH0001002	C1005CH1H0R5BT000F 0.5pF 0.1PF 50V NP0 -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C238,C410	Capacitor, Ceramic, Chip	ECZH0001116	C1005X7R1H271KT000F 270pF 10% 50V X7R -55TO+125C 1005 R/TP -TDK KOREA COOPERATION	
6	C103,C310, C400,C412, C415,C602	Capacitor, Ceramic, Chip	ECZH0001215	C1005X5R1A105KT000F 1uF 10% 10V X5R -55TO+85C 1005 R/TP -TDK KOREA COOPERATION	
6	C502,C503	Capacitor, Ceramic, Chip	ECZH0001217	GRM155R60J474K 470nF 10% 6.3V X5R -25TO+70C 1005 BK-DUP -MURATA MANUFACTURING CO.,LTD.	
6	C201,C202, C207,C210, C211,C212, C213,C214, C215,C216, C217,C218, C219,C220, C221,C222, C223,C228, C230,C234, C235,C259, C260,C264, C269,C270, C271,C273, C301,C303, C304,C305, C306,C307, C308,C404, C417,C501, C510,C511, C517,C518, C608,C609	Capacitor, Ceramic, Chip	ECZH0003103	GRM36X7R104K10PT 100nF 10% 10V X7R -55TO+125C 1005 R/TP -MURATA MANUFACTURING CO.,LTD.	
6	C504,C505	Capacitor, Ceramic, Chip	ECZH0003126	GRM155R71A393K - - - -55TO+125C - - -MURATA MANUFACTURING CO.,LTD.	
6	C402	Capacitor, Ceramic, Chip	ECZH0003503	GRM188R61E105K 1uF 10% 25V X5R -55TO+85C 1608 R/TP -MURATA MANUFACTURING CO.,LTD.	
6	C401	Capacitor, Ceramic, Chip	ECZH0003504	GRM188R71E104K 100nF 10% 25V X7R -55TO+125C 1608 R/TP -MURATA MANUFACTURING CO.,LTD.	
6	C141	Capacitor, Ceramic, Chip	ECZH0004402	MCH153C104ZK 0.1uF 10% 16V NP0 -55TO+125C 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	C724	Capacitor, Ceramic, Chip	ECZH0025911	GRM0335C1E120J 12pF 5% 25V C0G -55TO+125C 0603 R/TP -MURATA MANUFACTURING CO.,LTD.	
6	C132,C179	Capacitor, Ceramic, Chip	ECZH0025916	GRM0335C1E330J 33pF 5% 25V NP0 -55TO+125C 0603 R/TP -MURATA MANUFACTURING CO.,LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	C154,C155, C156,C719	Capacitor,Ceramic,Chip	ECZH0025920	GRM033R71C102K 1nF 10% 16V X7R -55TO+125C 1608 R/TP - MURATA MANUFACTURING CO.,LTD.	
6	D800	Diode,Switching	EDSY0011901	SDB310Q 340mV 30V 200mA 1A 0SEC 150mW EMD2 R/TP 2P 1AUK CORP	
6	ZD270,ZD402	Diode,TVS	EDTY0008601	PSD05-LF 5V 6 13.5V 42A 500W SOD323 R/TP 2P 1PROTEK DEVICES INC.	
6	ZD401	Diode,TVS	EDTY0008606	PRSB6.8C 4.7V 5.7 - - 10W - R/TP 2P 1PROTEK DEVICES INC.	
6	C113,C147, C148,L103	Inductor,Multilayer,Chip	ELCH0001056	1005GC2T2N7SLF 2.7NH 0.3NH 0V 300mA 0.17OHM 5.5GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	C144	Inductor,Multilayer,Chip	ELCH0001057	1005GC2T3N9SLF 3.9NH 0.3NH 0V 300mA 0.22OHM 4GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L205	Inductor,Multilayer,Chip	ELCH0001401	LL1005-FHL15NJ_ 15NH 5% 0V 300mA 0.5OHM 2.5GHZ 9 NON SHIELD 1 1.0X0.5X0.5MM R/TPTOKO, INC.	
6	C100,L123, L125	Inductor,Multilayer,Chip	ELCH0001406	LL1005-FHL4N7S 4.7NH 0.3NH 0V 400mA 0.2OHM 6GHZ 9 NON SHIELD 1 1.0X0.5X0.5MM R/TPTOKO, INC.	
6	L112	Inductor,Multilayer,Chip	ELCH0004703	1005GC2T1N0S00 1005GC2T1N0S00,1 nH,S ,1005 ,R/TP , PILKOR ELECTRONICS LTD.	
6	C712	Inductor,Multilayer,Chip	ELCH0004704	1005GC2T4N7S00 4.7NH 5% 0V 300mA 0.23OHM 3.5GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	C117,C121, L110,L124	Inductor,Multilayer,Chip	ELCH0004705	1005GC2T8N2J00 8.2NH 5% 0V 250mA 0.37OHM 2.8GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	C127,C169	Inductor,Multilayer,Chip	ELCH0004706	1005GC2T10NJ00 10NH 5% 0V 250mA 0.42OHM 2.5GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L117	Inductor,Multilayer,Chip	ELCH0004708	1005GC2T2N7S00 2.7NH 5% 0V 200mA 1.3OHM 1GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L109	Inductor,Multilayer,Chip	ELCH0004709	1005GC2T3N3S00 3.3NH 0.3NH 0V 300mA 0.19OHM 4.5GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L101	Inductor,Multilayer,Chip	ELCH0004710	1005GC2T15NJ00 15NH 5% 0V 250mA 0.53OHM 2GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L118	Inductor,Multilayer,Chip	ELCH0004713	1005GC2T6N8J00 1005GC2T6N8J00,6.8 nH,J ,1005 ,R/TP , PILKOR ELECTRONICS LTD.	
6	L203,L204	Inductor,Multilayer,Chip	ELCH0004715	1005GC2T27NJ00 27NH 5% 0V 200mA 0.9OHM 1.4GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L206	Inductor,Multilayer,Chip	ELCH0004716	1005GC2T39NJ00 39NH 5% 0V 200mA 1.2OHM 1.2GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L100,L102, L104,L106	Inductor,Multilayer,Chip	ELCH0004718	1005GC2T5N6S00 5.6NH 0.3NH 0V 300mA 0.27OHM 3.2GHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L111	Inductor,Multilayer,Chip	ELCH0004727	1005GC2TR10J00 100NH 5% 0V 100mA 2.3OHM 600MHZ 8 NON SHIELD 1 1.0X0.5X0.5MM R/TPPILKOR ELECTRONICS LTD.	
6	L115	Inductor,Multilayer,Chip	ELCH0005010	HK10051N8S 1.8NH 0.3NH 0V 8A 11GOHM 60mHZ 300m NON SHIELD 1 1.0X0.5X0.5MM R/TPTAIYO YUDEN CO.,LTD	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	L200,L201, L202	Inductor,Wire Wound,chip	ELCP0008014	MIPSZ2012D4R7 MIPSZ2012D4R7,4.7 uH,N,2.0X1.2X1.0,R/TP FDK CORPORATION.	
6	CN800	Connector,BtoB	ENBY0041501	GB042-70S-H10-E3000 70P 0.40MM STRAIGHT FEMALE SMD R/TP 1M -LS Mtron Ltd.	
6	CN801	Connector,I/O	ENEY0003801	24-8000-002-000-829 2P 1.00MM ANGLE SOCKET TYPE SMD R/TP -KYOCERA ELCO KOREA SALES CO.,LTD.	
6	CN400	connector,I/O	ENRY0008801	GU073-5P-SD-E1500 GU073-5P-SD-E1500,5,mm,ANGLE LS Mtron Ltd.	
6	S600	Card Socket	ENSY0022201	CAM-H88 24,ETC,mm,7*7,1.3M (1/5") Socket Type MITSUMI ELECTRIC CO.,LTD.	
6	S300	Socket,Card	ENSY0023501	104042-001 Micro-SD 8P ANGLE SMD R/TP -HANKOOK MOLEX	
6	J300	Card Socket	ENSY0024701	GCA26C-8S-H15-E1500 SIM 8P ANGLE SMD R/TP -LS Mtron Ltd.	
6	SW100	connector,RF	ENWY0004401	RF-800 0.40MM STRAIGHT SOCKET SMD R/TP AU 50OHM 500mDBDONG EUN	
6	CN401	Connector,Terminal Block	ENZY0028601	04-9248-003-017-829+ 3P 2.50MM STRAIGHT SMD R/TP - KYOCERA ELCO KOREA SALES CO.,LTD.	
6	C174,R113	Resistor,Chip	ERHY0000104	MCR01MZP5F49R9 49.9OHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R702	Resistor,Chip	ERHY0000128	MCR01MZP5F1502 15KOHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R408	Resistor,Chip	ERHY0000185	MCR01MZP5F8200 820OHM 1% 1/16W 1005 R/TP -ROHM.	
6	R276,R277	Resistor,Chip	ERHY0000254	MCR01MZP5J472 4.7KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R305,R306, R307,R308, R309	Resistor,Chip	ERHY0000275	MCR01MZP5J563 56KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R205	Resistor,Chip	ERHY0003201	MCR01MZP5F1001 1KOHM 1% 1/16W 1005 R/TP -ROHM.	
6	R406	Resistor,Chip	ERHY0003301	MCR01MZP5J101 100OHM 5% 1/16W 1005 R/TP -ROHM.	
6	R101,R102, R105,R106	Resistor,Chip	ERHY0009302	MCR006YZPF1001 1KOHM 1% 1/4W 0603 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R109	Resistor,Chip	ERHY0009586	MCR006YZPF2201 2.2KOHM 1% 1/20W 0603 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R273	Resistor,Chip	ERHY0024201	MCR01MZP5F6041 6040 ohm,1/16W,F,1005,R/TP ROHM.	
6	R116,R117	Resistor,Chip	ERHZ0000201	MCR01MZP5F1000 100OHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R200,R270	Resistor,Chip	ERHZ0000204	MCR01MZP5F1003 100KOHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R600,R601	Resistor,Chip	ERHZ0000206	MCR01MZP5F10R0 100OHM 0.1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R407	Resistor,Chip	ERHZ0000236	MCR01MZP5F2001 2KOHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	R405	Resistor,Chip	ERHZ0000318	MCR01MZF5F8062 80.6KOHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R271	Resistor,Chip	ERHZ0000323	MCR01MZF5F9102 91KOHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R114	Resistor,Chip	ERHZ0000401	MCR01MZF5J000 0OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R202,R272, R301,R302, R303	Resistor,Chip	ERHZ0000405	MCR01MZF5J103 10KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R404	Resistor,Chip	ERHZ0000406	MCR01MZF5J104 100KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R110	Resistor,Chip	ERHZ0000428	MCR01MZF5J180 18OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	C114,R108, R206,R401, R402	Resistor,Chip	ERHZ0000434	MCR01MZF5J1R0 1OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R502,R503	Resistor,Chip	ERHZ0000435	MCR01MZF5J200 20OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R300	Resistor,Chip	ERHZ0000438	MCR01MZF5J203 20KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R278,R279, R280,R281, R400,R403	Resistor,Chip	ERHZ0000443	MCR01MZF5J222 2.2KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R111,R112	Resistor,Chip	ERHZ0000458	MCR01MZF5J301 300OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R274,R275	Resistor,Chip	ERHZ0000484	MCR01MZF5J471 470OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R207	Resistor,Chip	ERHZ0000486	MCR01MZF5J473 47KOHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R209,R313	Resistor,Chip	ERHZ0000490	MCR01MZF5J510 51OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R115	Resistor,Chip	ERHZ0000504	MCR01MZF5J680 68OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R310,R311, R312,R314, R315	Resistor,Chip	ERHZ0000527	MCR01MZF5J201 200OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	U1	IC,Analog Switch	EUSY0347001	DG2735DN-T1-E4 MiniQFN-10L ,10 PIN,R/TP ,1.8X1.4X0.55,0.6 Dual SPDT Analog Switch , ,IC,Analog Switch VISHAY INTERTECHNOLOGY ASIA PTE LTD	
6	U300	IC,MCP,NAND	EUSY0347506	H8BCS0SI0BAR-46M NAND/2G SDRAM/1G 1.7VTO1.9V 14.0x10.0x1.2 TR 149P - - HYNIX SEMICONDUCTOR INC.	
6	U200	IC,Digital Baseband Processor,3G	EUSY0369203	QSC6270-E 0VTO0V 0W BGA R/TP 424P -QUALCOMM INCORPORATED.	
6	IC500	IC,Audio Sub System	EUSY0403901	WM9093ECS/R 1.71~5.5V 0W WLCSP R/TP 20P -WOLFSON MICROELECTRONICS PLC	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	U600	IC,Digital Signal Processors	EUSY0407401	RT9032 WDFN8L,8,R/TP,Programmable Dual LDO,IC,LDO Voltage RegulatorIC,LDO Voltage Regulator RICHTEK TECHNOLOGY CORP.	
6	U400	IC,Voltage Reference	EUSY0410801	RT9524 DFN,10,R/TP,DFN Cal Test Mode Single Charger IC for Micro USB,IC,ChargerIC,Charger RICHTEK TECHNOLOGY CORP.	
6	U700	IC,Bluetooth	EUSY0418701	BCM2070B2KUBXG 2.3VTO5.5V 158.4mW WLBGA R/TP 42P - BROADCOM ASIA DISTRIBUTION PTE LTD	
6	IC400	IC,Analog Multiplexer	EUSY0424801	RT8963WS WLCSP,20,R/TP,MUIC-Basic,USB HS,UART,Audio,IC,Analog MultiplexerIC,Analog Multiplexer RICHTEK TECHNOLOGY CORP.	
6	X700	Crystal	EXXY0024401	TSX-3225 26MHZ 26MHZ 10PPM 10pF NA SMD R/TPSEIKO EPSON CORP	
6	X201	Crystal	EXXY0025101	DSX321G - 10PPM - - - SMD P/TPDAISHINKU CORPORATION.	
6	X200	Crystal	EXXY0026901	Q13FC1350000300 32.768KHZ 20PPM 0F NONE SMD R/TPEPSON TOYOCOM CORP	
6	FL104	Filter,Duplexer,DCN	SDDY0005101	B7671 881500000 869 to 894 836500000 824 to 849 2.7 2.1 2.5x2.0x0.68 DUAL SMD R/TP -EPCOS PTE LTD.	
6	FL102	Filter,Duplexer,IMT	SDMY0002601	B7696 2140000000 2112.4 to 2167.6 1950000000 1922.4 to 1977.6 2.6 1.9 2.5x2.0x0.89 DUAL SMD R/TP -EPCOS PTE LTD.	
6	PT200	Thermistor	SETY0007301	NCP15WF104F03RC NTC,100000 ohm,SMD,4250K+/-1%,100K,1%,0.1mA,4250K+/-1%,SMD,R/TP MURATA MANUFACTURING CO.,LTD.	
6	VA802, VA812, VA813	Varistor	SEVY0001001	EVLC14S02050 14V 0% 50F 1.0*0.5*0.6 NONE SMD R/TPAMOTECH CO., LTD.	
6	VA400	Varistor	SEVY0003601	ICVL0505101V150FR 5.6V 0% 60F 1.0*0.5*0.55 NONE SMD R/TPINNOCHIPS TECHNOLOGY	
6	VA500, VA501	Varistor	SEVY0004101	ICVN0505X150FR 5.6V 0% 360F 1.0*0.5*0.55 NONE SMD R/TPINNOCHIPS TECHNOLOGY	
6	VA600, VA601, VA602, VA603	Varistor	SEVY0004301	ICVL0518100Y500FR 18V 0% 10F 1.0*0.5*0.55 NONE SMD R/TPINNOCHIPS TECHNOLOGY	
6	VA301, VA302, VA303, VA304, VA305, VA306, VA307, VA308, VA309, VA310, VA311	Varistor	SEVY0005101	ICVL0518050FR 18V 0% 5F 1.0*0.5*0.55 NONE SMD R/TPINNOCHIPS TECHNOLOGY	
6	VA800, VA801	Varistor	SEVY0005202	EVLC5S02100 5.5V 0% 100F 1.0*0.5*0.6 UL SMD R/TPAMOTECH CO., LTD.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	VA270, VA271, VA272, VA273, VA274, VA275	Varistor	SEVY0005403	ICVS0518270FR 18V 0% 27F 1.0X0.5X0.55 NONE SMD R/TPINNOCHIPS TECHNOLOGY	
6	FL100	Filter,Separator	SFAY0013601	D5024 1.15 35 35 GSM Quad,UMTS Triple,1.15 dB,1.5 dB,40 dB,40 dB,4532,GSM LB HB Diplexing,FEMEPCOS PTE LTD.	
6	FB700	Filter,Bead	SFBH0000903	HB-1M1005-601JT 600 ohm 1.0*0.5*0.5 SMD R/TP 2PCERATECH CORPORATION	
6	FB500,FB501, FB502,FB503, FB505,FB506	Filter,Bead	SFBH0009801	HH-1M1005-601JT 600Ohm 1.0 * 0.5 * 0.5 SMD P/TP 2PCERATECH CORPORATION	
6	FL700	Filter,Ceramic	SFCY0000901	LFB212G45SG8A166 BPF 2.45KHZ 100Hz SMD R/TP 4PMURATA MANUFACTURING CO.,LTD.	
6	FL800,FL801, FL802,FL803, FL804,FL805	Filter,EMI/Power	SFEY0011601	ICVE10184E150R500FR ESD/EMI 0HZ 15pF 0H SMD R/TPINNOCHIPS TECHNOLOGY	
6	FL600,FL601, FL602	Filter,EMI/Power	SFEY0013701	EVRC18S03Q015100R ESD/EMI 330HZ 15F 0H SMD R/TPAMOTECH CO., LTD.	
6	FL400	Filter,EMI/Power	SFEY0015301	NFM18PC104R1C3 ESD/EMI 0HZ 0.1uF 0H SMD R/TPMURATA MANUFACTURING CO.,LTD.	
6	FL103	Filter,Saw	SFSY0035101	B9414 1950 1.4*1.1*0.45 SMD R/TP -EPCOS PTE LTD.	
6	U100	IC,Power Amplifier	SMPY0019101	SKY77336 SKY77336,dBm,%A,dBc,dB,5x5,SMD,Polar Edge for QCT SKYWORKS SOLUTIONS INC.	
6	U101	IC,Power Amplifier	SMPY0022701	SKY77701 28.25 dBm,40 %,10 mA,-40 dBc,27 dB,3.0*3.0*1.0,SMD,WBAND 1,LBAND 1,CPL,3 MODE,3.2V~4.2V,28.25dBm,1,SMD,R/TP,10,3.2V~4.2V,28.25dBm,1 SMD,R/TP,10 SKYWORKS SOLUTIONS INC.	
6	MIC500	Microphone,Condenser	SUMY0010610	SPM0410LR5H-QB SPM0410LR5H-QB,UNIT,42 dB,4.72*3.76*1.25,memsTDMA Improve KNOWLES ACOUSTICS	
5	SAFD00	PCB Assembly,Main,SMT Top	SAFD0148804 7	LG-A310 ORPVD MAIN,1.0	
6	LD800,LD801	LED,Chip	EDLH0015106	99-216UFC/2229017/TR8 WHITE 2.95~3.25 30mA 1200~1600mcd x, y 110mW - R/TP 2P -EVERLIGHT ELECTRONICS CO., LTD.	
6	R812,R813	Resistor,Chip	ERHY0003301	MCR01MJP5J101 100OHM 5% 1/16W 1005 R/TP -ROHM.	
6	R801	Resistor,Chip	ERHZ0000204	MCR01MJP5F1003 100KOHM 1% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	R802,R803, R804,R805, R806,R807, R808,R809, R814,R815	Resistor,Chip	ERHZ0000483	MCR01MJP5J470 470OHM 5% 1/16W 1005 R/TP -ROHM Semiconductor KOREA CORPORATION	
6	RA800	Resistor,Array	ERNR0000404	MNR04M0APJ104 100KOHM 5% 1/16W 4 SMD R/TP 8P 0 1005X4ROHM.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

Level	Location No.	Description	Part Number	Spec	Remark
6	VA803, VA804, VA805, VA806, VA807, VA808, VA809, VA810, VA811	Varistor	SEVY0001001	EVLC14S02050 14V 0% 50F 1.0*0.5*0.6 NONE SMD R/TPAMOTECH CO., LTD.	
6	SPFY02	PCB,Main	SPFY0232301	SPFY0232301 FR-4 Staggered via STAGGERED-10 0.8 GU300 ORF,MAIN,D,FR-4,0.8 mm,STAGGERED-10UNITECH PRINTED CIRCUIT BOARD CORP.	

12. EXPLODED VIEW & REPLACEMENT PART LIST

12.3 Accessory

Note: This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

Level	Location No.	Description	Part Number	Spec	Remark
2	SBPL00	Mobile Phone Battery Li-Ion	SBPL0098901	LGIP-430N-WW-LGC LGIP-430N-WW-LGC,3.7 V,900 mAh,1 CELL,PRISMATIC ,463450,innerpack, WW LG CHEMICAL	
2	SSAD00	Adapters	SSAD0033201	STA-U34ED STA-U34ED,100-240V,5060 Hz,5.1 V,0.7 A,CE,AC-DC ADAPTOR DONG DO ELECTRONICS CO., LTD	
2	SSAD00	Adapters	*S*SSAD0033202	STA-U34ER STA-U34ER,100-240V,5060 Hz,5.1 V,0.7 A,CE,AC-DC Adaptor SUNLIN ELECTRONICS CO.,LTD	
2	SSAD00	Adapters	*S*SSAD0033203	STA-U34ES STA-U34ES,100-240V,5060 Hz,5.1 V,0.7 A,CE,AC-DC ADAPTOR SALCOMP OY	
2	SSAD00	Adapters	*S*SSAD0033204	STA-U34EV STA-U34EV,100-240V,5060 Hz,5.1 V,0.7 A,CE,AC-DC ADAPTOR Power Systems Technologies Far East Ltd	